

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS
 (CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
 Required under the Authority of 1976 PA 399, as amended

ENTERED

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Environmental Quality (DEQ) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint 4500 N. Dort Highway Flint, MI 48505 WSSN: 02310	Permit Stamp Area (DEQ use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 151104 OCT 28 2015 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976	
2. Owner's Contact Person (provide name for questions): Contact: Brent Wright Title: Water Plant Supervisor Phone: 810.787.6537		
3. Project Name (Provide phase number if project is segmented): Flint WTP Phase II, Segment 4 Corrosion Control	4. Project Location (City, Village, Township): Flint, MI	5. County (location of project): Genesee

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY

cc:

DEQ
 RESOURCE MANAGEMENT DIVISION

OCT 16 2015

LANSING DISTRICT

Issued by:

Reviewed by:

☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DEQ District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

- 6. Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions will be returned. SEE EXAMPLES BELOW. Use additional sheets if needed.

The project entails installation of phosphate feed systems at both Control Station #2 (CS#2) and Pump Station #4 (PS#4). Feed at CS#2 will provide the ability to add phosphate for corrosion control to finished water supplied from the Detroit Water & Sewer Department (DWSD). Feed at PS#4 will provide the ability to add phosphate to finished water to supply from either the Flint River or Lake Huron via the Karegondi Water Authority (KWA). Both feed systems are temporary systems until the planned filter transfer pump station is constructed. A permanent phosphate feed system will be constructed as part of that contract.

The feed rate will be proportionally controlled based on the water flow rate and will be tied to the existing SCADA system. See attached basis of design for more detailed information.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.	
7. Design engineer's name, engineering firm, address, phone number, and email address: Jeremy Nakashima, PE Lockwood, Andrews and Newnam, Inc. 1311 South Linden Rd, Suite B Flint, MI 48532 jnnakashima@lan-inc.com	8. Indicate who will provide project construction inspection: ☐ Organization listed in Box 1. ☒ Engineering firm listed in Box 7. ☐ Other - name, address, and phone number listed below.
9. Is a basis of design attached? ☒ YES ☐ NO If no, briefly explain why a basis of design is not needed.	
10. Are sealed and signed engineering plans attached? ☒ YES ☐ NO If no, briefly explain why engineering plans are not needed.	
11. Are sealed and signed construction specifications attached? ☒ YES ☐ NO If specifications are not attached, they need to be on file at DEQ.	
12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed? ☒ YES ☐ NO If no, explain which deviations were made and why.	
13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved? ☒ YES ☐ NO If no, describe what coatings, additives or materials did not meet the applicable standard and why.	
14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement? (For projects not located in the public right-of-way, utility easements must be shown on the plans.) ☒ YES ☐ NO If no, explain how access will be obtained.	
15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451? ☐ YES ☒ NO If yes, a wetland permit must be obtained.	
16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules? ☐ YES ☒ NO If yes, a flood plain permit must be obtained.	
17. Is the project construction activity within 500 feet of a lake, reservoir, or stream? ☐ YES ☒ NO If yes, a Soil and Erosion Control Permit must be obtained <u>or</u> indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.	

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?

☐ YES ☒ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☒ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES ☒ NO

If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) _____

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☐ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DEQ.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, BRENT F. WRIGHT (name), acting as the PLANT SUPERVISOR (title/position) for

CITY OF FLINT WATER PLANT (entity owning proposed facilities)

certify that this project has

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.

Signature*

Date

Phone

*Original signature only, no photocopies will be accepted.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

PROJECT BASIS OF DESIGN – FOR WATER MAIN PROJECTS

PROJECT NAME: Flint WTP Phase II, Segment 4 Corrosion Control

For this PROJECT the following information must be provided per Act 399 unless waived by the Department. For projects other than water main installation, or if additional space is needed, attach separate sheet(s) with detailed Basis of Design calculations.

- A. A general map of the initial and ultimate service areas
☒ Included on engineering plans ☐ Attached separately
- B. Number of service connections served by this permit application all customers
- C. Total number of service connections ultimately served by entire project all customers
- D. Residential Equivalent Units (REUs) served by this permit application _____
- E. Total Residential Equivalent Units (REUs) ultimately served by entire project _____
- F. Water flow rates for proposed project based on REUs listed in "D" and "E" above
- | | |
|--|---------------------------|
| 1. Initial design average day flow (mgd) | <u>18.3</u> |
| 2. Initial design maximum day flow (mgd) | <u>25.4</u> |
| 3. Total design average day flow (mgd) | <u>24.0</u> |
| 4. Total design maximum day flow (mgd) | <u>36.0</u> |
| 5. Required fire flows: ⁽¹⁾ | _____ gpm for _____ hours |
- G. Actual flows and pressures of existing system at the connection point(s) ⁽²⁾
- | |
|------------------------|
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
- H. Estimated minimum flows and pressures within the proposed water main system ⁽³⁾
- | |
|------------------------|
| _____ gpm at _____ psi |
|------------------------|

- (1) Every water system must decide what levels of fire fighting flows they wish to provide. Fire flow should be appropriate for the area (residential, commercial, industrial) being served by the project. Typical fire flow rates can be obtained from the water supply, local fire dept., ISO or AWWA. The water system must then be designed to be able to provide the required fire flows while maintaining at least 20 psi in all portions of the distribution system.
- (2) Flows and pressures at the connection points must be given to determine if the existing water main(s) are able to deliver water to the new service area. These numbers can be obtained from a properly modeled and calibrated distribution system hydraulic analysis or hydrant flow tests performed in the field. If more than one connection is proposed, list as needed.
- (3) List what the estimated minimum flows can be expected in the proposed water mains based on estimated water demands, head losses, elevation changes and other factors that may affect flows, such as dead end mains.

City of Flint

Phase II, Segment 4 Corrosion Control

Basis of Design

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

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

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

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

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



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

TRANSMITTAL

Filing Data Code 1-07

PLANNING

ENGINEERING

PROGRAM MANAGEMENT

Est. 1935

AUSTIN, TX

CHICAGO, IL

CLEARWATER, FL

COLLEGE STATION, TX

DALLAS, TX

FLINT, MI

FORT WORTH, TX

HOUSTON, TX

HUNTINGTON BEACH, CA

LAS VEGAS, NV

LOS ANGELES, CA

MIAMI, FL

MILPITAS, CA

PHOENIX, AZ

SACRAMENTO, CA

SAN ANTONIO, TX

SAN MARCOS, TX

WACO, TX

☐ UPS
☐ FEDEX

☐ DELIVERY SERVICE
☐ HAND DELIVER
☐ OVERNIGHT

☐ REGULAR MAIL
☐ PICK-UP
☒ OTHER Extranet(To PM)

To: Michael Prysby		Date 10-16-13	
Company: MDEQ		Project Number 130-10701-001	
Address: 525 WEST ALLEGAN STREET Lansing, MI 48933		Routing:	
Project: City of Flint Water Treatment Plant Improvements.			
We Are Sending You: ☐ Shop Drawings ☐ Original Drawings ☒ Prints ☐ Specifications ☐		These Are Transmitted: ☐ As Requested ☒ For Your Use ☒ For Review and Comment ☐ For Your Signature ☐	

Quantity	Description
3	Full Set of Plans for Ph2-Seg4 Corrosion Control
1	Act 399 Permit Application
1	11x17 Set of Plan for Ph2-Seg4 Corrosion Control

Remarks

These plans have been modified slightly from the set electronically submitted last night.

We look forward to your comments and approval.

Thanks.

DEQ
RESOURCE MANAGEMENT DIVISION
OCT 16 2015
LANSING DISTRICT

1311 SOUTH LINDEN ROAD
SUITE B
FLINT, MI 48532

TEL 810.820.2682

FAX 810.820.2703

www.lan-inc.com

Distribution	Prepared By
1- Mike Glasgow 2- Brent Wright 3- File	Samir Matta, PE

IBC TOTE SCALE

FOR CHEMICAL IBC TOTES

Safely track
chemical usage
and tank levels

Warn of dangerous
over and under-
feed conditions

Prevent system
from running
empty

4-20mA remote
monitoring reduces
operator exposure
to chemicals



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

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

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



FORCE FLOW

IBC TOTE SCALE

MODELS AND ORDERING INFORMATION

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

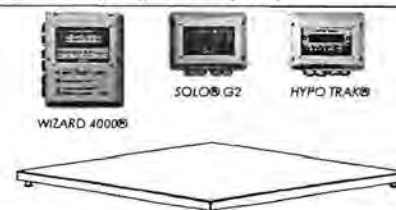
ELECTRONIC - Single Load Cell Platform (Includes platform with backstop and electronic load cell with 20 ft. cable. Lengths up to 100 ft. available; request when ordering.)

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



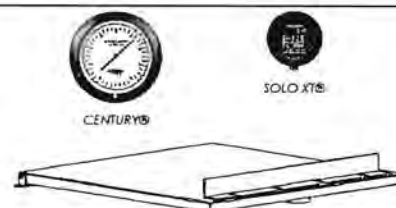
ELECTRONIC - Hi Accuracy 4-Load Cell Platform (Includes platform and (4) electronic load cells with 20 ft. of cable. Lengths up to 100 ft. available; request at time of purchase. Backstop not included or necessary on these models but available upon special request.)

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

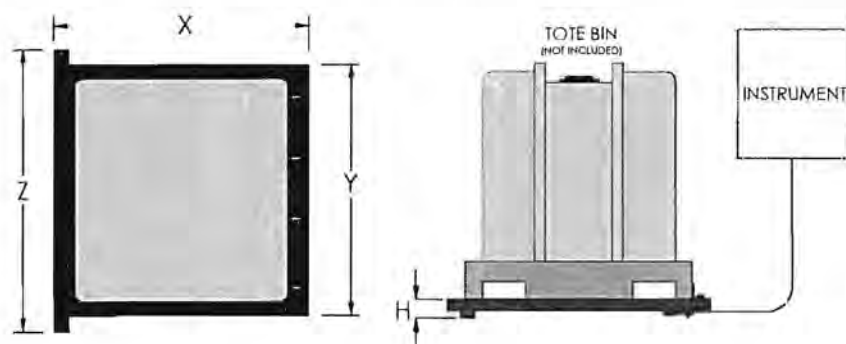


HYDRAULIC - Single Load Cell Platform (Includes platform with backstop, and hydraulic load cell with 12 ft. Hose and quick connect. Hose/tubing lengths up to 100 ft. available to allow remote mounting of indicator; request at time of purchase.)

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



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



SPECIFYING GUIDELINES:

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

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

FORCE FLOW

MODEL NUMBERS (for Load Cell & Platform)

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

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

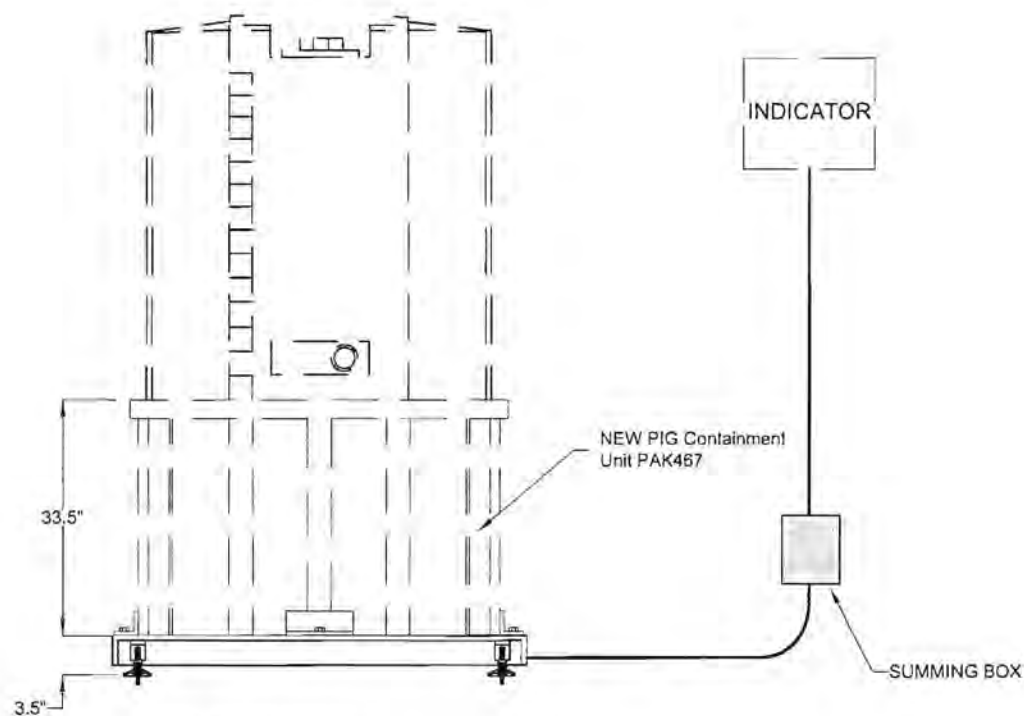
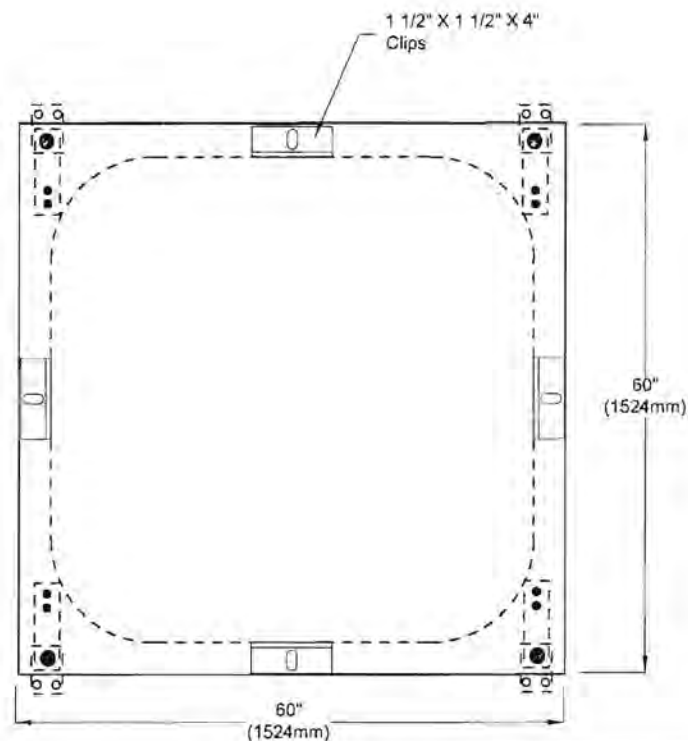
MODEL NUMBER (for SOLO 1000 Indicator)

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

MODEL NUMBER (Containment Unit)

PAK467 400 gal. NEW PIG Poly IBC Containment Unit

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

**INSTALLATION NOTE:**

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

FORCE FLOW

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

P:\EMAIL\SUBMITTAL FORMS\A\local Drawings\31431 HA Tote Bin Scale 60 Containment.dwg

HI-ACCURACY ELECTRONIC
 60" TOTE BIN SCALE
 CONTAINMENT

Drawn by: KBV

Date: 1/23/09

Revised: 4/13/10

Scale:

Drawing Number

31431

---NOT SUPPLIED BY FORCE FLOW---
For use with Force Flow Scale Model 60-DR100TCHA4



New Pig

Your partner for a clean
and safe workplace.

1-800-HOT-HOGS® (468-4647)

Product Data Sheet

Item Number: PAK467

Item Name: PIG® Poly IBC Containment Unit

Load Capacity UDL:

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

Sump Capacity:

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

Options Available:

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

Color: White/Black

Description:

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

Application:

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

Product Features:

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

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

Composition:

- Sump - Polyethylene
- Grates - Injection Molded Polyethylene

This product helps you comply with:

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

Additional Specifications:

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

Disclaimers:

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

PDS generated: Jul 14, 2008

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

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Flint Phosphate Calculations

Chemical will be 75% NSF certified Phosphoric acid

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

Of this 75% is Phosphoric acid (H_3PO_4) = 4,480 g H_3PO_4 /gal

Molecular weight of H_3PO_4 is 97.9913 g/mole

Moles H_3PO_4 / gal = 45.72

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 151104 OCT 28 2015

Proposed Operating Parameters

Assumptions per DEQ:

- City of Detroit residual is 0.39 mg/l as P
- MDEQ wants Flint to maintain a residual of approximately 1.0 mg/l as P
- Feed pump capacity should be sized for a max dose of 2.0 mg/l as P

	Plant Flow	Dosage as PO_4^{-3} *	Dosage as P
Maximum	25 MGD	6.13 mg/l	2.0 mg/l
Average	16 MGD	3.07 mg/l	1.0 mg/l
Minimum	8 MGD	1.53 mg/l	0.5 mg/l

*Equivalent dosage to P dosage

Feed Rate Calculations

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

$$25 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times 2.0 \text{ ppm} / 1,408 \text{ g/gal} = 134.30 \text{ gpd Phosphoric Acid}$$

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

$$16 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times (1.0 \text{ ppm} - 0.39 \text{ ppm}) / 1,408 \text{ g/gal} = 26.21 \text{ gpd Phosphoric Acid}$$

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

$$8 \text{ MGD} \times 3782 \text{ g/gal H}_2\text{O} \times (1.0 \text{ ppm} - 0.39 \text{ ppm}) / 1,408 \text{ g/gal} = 13.10 \text{ gpd Phosphoric Acid}$$

Storage Requirements

30 days supply at average flow and dosage = $26.21 \text{ gpd} \times 30 \text{ days} = 786 \text{ gal.}$

Assuming the use of 275 gal semi-bulk totes, 3 totes required (recommend 2 in service, 1 spare)

Four Function Valve
AUTOPRIME™ Liquid End
High Viscosity Liquid End
Low Level Float Switch
Digi-Pulse Flow Monitor
Repair & Preventive Maintenance Kits
Calibration Columns

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Series C Chemical Metering Pumps

Series C Chemical Metering Pumps

Series C Chemical Metering Pumps have been an industry standard for over 20 years. Designed for Municipal/Industrial applications, the familiar yellow and black pumps have a rugged, totally enclosed, chemically resistant housing for protection in the harshest environments. Encapsulated electronics and a rigid housing and stroke bracket ensure years of precise, repeatable performance.



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- Adjustable stroke frequency and the flexibility of up to 1000:1 turndown ratio
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- NEMA 4X / IP65 enclosures for protection against corrosive environments
- Time tested electronics for reliable, repeatable performance
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- Models with external pacing for flow proportional applications
- Advanced control options for simplified system integration (pulse multiply/divide, 4-20 mA, remote on/off)
- *UL, *CUL, NSF 50, NSF 61, *CE Certifications

Control Codes:

- 1 - Dual Manual Control (speed and stroke length)
- 7 - Pulse Input / Dual Manual Control
- 9 - Pulse/Analog Input / Dual Manual Control

Output Codes with standard liquid end	
Max Capacity:	Max Pressure:
*CX0 - 1.3 GPH (4.9 l/h)	300 psi (20.7 Bar)
*CX1 - 2.5 GPH (9.5 l/h)	150 psi (10.3 Bar)
*CX2 - 4.0 GPH (15.1 l/h)	100 psi (6.9 Bar)
*CX3 - 8.0 GPH (30.3 l/h)	60 psi (4.1 Bar)
*CX4 - 20 GPH (75.7 l/h)	25 psi (1.7 Bar)
C76 - 4.0 GPH (15.1 l/h)	175 psi (12.1 Bar)
C77 - 10.0 GPH (38.0 l/h)	80 psi (5.5 Bar)
C78 - 25 GPH (95.0 l/h)	30 psi (2.07 Bar)

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 151104007-062219

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1976

MEP

Prysby, Mike (DEQ)

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

Mike,

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

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

We have not been able to obtain comprehensive water quality data for the finished water characteristics of the Detroit water that will be fed to Flint, to assess ranges of major chemical characteristic fluctuations. However, based upon the email trail, Detroit water entering the Flint system appears to only contain around 0.4 PO₄/L. This concentration range is entirely too low compared to that needed in studies presented and published in the last 20+ years that have focused on lead released directly from lead pipes, and the solubility of the most likely lead orthophosphate pipes scales. We also strongly feel that targeted dose of 0.8 mg PO₄/L is also too low, for the very same reason. We would be glad to share with you numerous standard corrosion control and treatment reference works, best practices guides and published results from US and international lead corrosion control field and pilot studies. Secondly, the basis for that target (other communities using Lake Huron source use the same dose) is not scientifically derived nor does it consider water quality and the current state of Flint's distribution system. We have reviewed the original Detroit corrosion study and have seen some of the LCR monitoring data, and besides the fact that it did not directly pertain to this water source, few dosages were tested in the cited 1994 pipe loop study, and the higher dosage than the one implemented in the field currently was more effective. Based on the limited amount of data on the quality of Detroit water, what we know about the history of Detroit corrosion control, we think an orthophosphate residual of 3 to 4 mg PO₄/L should be the minimum starting test target residual for pipe passivation. It is likely that, at least initially a higher dosage will be necessary to reach the far ends of the distribution system and sufficiently reduce lead solubility and release from all lead sources. To allow flexibility, we feel the design of the chemical feed and storage systems should be able to consistently deliver a maximum dose of 5 to 6 mg PO₄/L, if substantial orthophosphate loss is observed, if the starting dose is set for the desired residual level of 3 to 4 mg/L as PO₄. We suggest that jar tests be performed in advance of orthophosphate addition to Detroit water to evaluate the impact of orthophosphate dose on turbidity that could result from interactions between orthophosphate and background Detroit water quality parameters (e.g., aluminum, calcium, etc.).

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

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

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

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

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

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

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

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

Darren and Mike

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

From: Prysby, Mike (DEQ) [mailto:PRYSBYM@michigan.gov]

Sent: Friday, October 16, 2015 1:32 PM

To: Lytle, Darren <Lytle.Darren@epa.gov>; Schock, Michael <Schock.Michael@epa.gov>

Cc: Busch, Stephen (DEQ) <BUSCHS@michigan.gov>

Subject: FW: Flint WTP PH2 SEG4 - Corrosion Control

Darren, Michael

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

Michael Prysby, P.E.

District Engineer

Office of Drinking Water and Municipal Assistance

517 290-8817

From: Matta, Samir [<mailto:SFMatta@lan-inc.com>]

Sent: Friday, October 16, 2015 12:02 AM

To: Prysby, Mike (DEQ)

Subject: Flint WTP PH2 SEG4 - Corrosion Control

Hi Mike,

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

Basis of Design

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

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

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

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

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

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

Thanks.

Samir F. Matta, PE
Team Leader



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

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QUESTIONS

① Clarify that you are expressing dosage of Phosphoric Acid as PO_4 product
ie 3-4 mg/l ml $\rightarrow$ is 1.0 mg/l as P

② Flint's pH WQP - ON FNT/DWED
maintain range (7.2 - 7.8)

③ Set WQ monitoring for Oct-Dec QTR

EPA sugg 8-10 sites for pH, Alk, ortho, turb, Fe 1/wk
from TCR or other?

④ Incoming PO_4 level @ P

⑤ PB sampling plan - use LCR sites w/ Lead services

* ~~Q~~ ~~we can~~ use concurre w/ dosages
* we can establish WQP Mon & PB Mon.
in accordance to ~~Q~~ LCR

* mini-study corr w/ TAC



WL Performance
Products LP

PRODUCT DATA SHEET

PRODUCT: Phosphoric Acid, 75%

NSF

GRADE: Technical

CODE: 750

GENERAL DESCRIPTION: Clear colorless liquid with no foreign odor

FORMULA: H_3PO_4

MOLECULAR WEIGHT: 98.0

CAS NO.: 7664-38-2

DATE EFFECTIVE: November 5, 2005

CHARACTERISTICS

SPECIFICATION LIMITS

Specific Gravity @ 25°/15.5°C

1.574 Minimum

Equivalent H_3PO_4 , %

75.0 Minimum

Equivalent P_2O_5 , %

54.3 Minimum

Color, APHA

20 Maximum

NOTE: Specification Limits are subject to change from time to time. Please contact us for current data sheet.

Plant Location: Carondelet (St. Louis), MO; Carteret, NJ; Lawrence, KS
 Packaging: 3000 gal. tank truck; 14,000 gal. tank cars.
 15 gal.(200 lb.) & 55 gal. (700 lb.) plastic drums (nonreturnable)
 Labeling Requirements: Product Label and DOT CORROSIVE label required by law.
 Shipping Classification: 1. Single package of 5000 lbs. or more:
 Phosphoric Acid
 CORROSIVE MATERIAL, UN 1805, RQ
 STCC4930248
 2. Single package of less than 5000 lbs.:
 Phosphoric Acid
 CORROSIVE MATERIAL, UN 1805
 STCC4930248

10495 10495

Handling Precautions:

NOT FOR FOOD OR DRUG USE. CORROSIVE TO MILD STEEL. DANGER! CAUSES BURNS TO EYES AND SKIN. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

FIRST AID: If in eyes or on skin, immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse.

IN CASE OF SPILL OR LEAK: Contain spill or leak to prevent discharge to environment. Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

This Product Data Sheet is subject to the terms and conditions on the reverse side hereof.

PHOSPHORIC ACID , 75%; TECHNICAL GRADE

Key Properties:

- Phosphoric acid is relatively non-volatile and stable at elevated temperatures; it is a much milder acid than sulfuric, nitric, or hydrochloric acids.
- Heavy, viscous liquid, 13.1 to 13.2 lbs./gal.
- Remains liquid at very low temperatures: Freezing point, -18°C (0.5°F)
- Shelf-life -- 24 months

Applications:

- Bonding agent for refractory materials
- Industrial and institutional cleaning and sanitizing products
- Liquid fertilizers
- Aluminum bright-dipping
- Metal treating and phosphatizing
- Flameproofing agent
- Catalyst in chemical processes
- Effluent treatment
- Animal feed supplement
- Potable Water Treatment: ICL Performance Products LP Phosphoric Acid, 75%, conforms to the requirements of ANSI / NSF Standard 60; used for corrosion and scale control.
Maximum Use Level = 13 mg/L.

FOR MORE COMPLETE INFORMATION ON PROPERTIES AND SAFE HANDLING OF THIS MATERIAL, SEE THE ICL PERFORMANCE PRODUCTS LP MATERIAL SAFETY DATA SHEET (MSDS).

NOTICE: Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, ICL Performance Products LP makes no representations or warranties as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will ICL Performance Products LP be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information or the product to which Information refers. Nothing contained herein is to be construed as a recommendation to use any product, process, equipment or formulation in conflict with any patent, and ICL Performance Products LP makes no representation or warranty, express or implied, that the use thereof will not infringe any patent. The data set forth herein are based on samples tested and are not guaranteed for all samples or applications. Such data are intended as guides and do not reflect product specifications for any particular product. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OR MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

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Corporate Offices:

622 Emerson Road
Suite 500
St. Louis, Missouri 63141
314-983-7500

For order assistance, please call our Customer Service Department Toll Free: 1-800-244-6169



Safety Data Sheet



1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identification

Product Name: PHOSPHORIC ACID (35% - 95%)
 Reference Number: AST10046
 Date: May 19, 2015
 Synonyms: Emulsi-Phos®; LuminEtch™, LuminEtch™ Ultra, PurEtch®;
 monophosphoric acid; orthophosphoric acid;

Multi

0484

Use of the substance or preparation

Phosphates and fertilizers, acid cleaners, aluminum brighteners and metal phosphatizing, leather tanning, varnish, synthetic rubber, and water treatment. Food grade is used as an acidulate for cola drinks, yeast nutrient, etc. NSF International certifies phosphoric acid under Standard 60 as an acceptable drinking water treatment chemical.

Company/Undertaking Identification

ICL PERFORMANCE PRODUCTS LP
 622 Emerson Road - Suite 500
 St. Louis, Missouri 63141

Emergency telephone: In USA call CHEMTREC: 1 800 424 9300

Outside the USA, including ships at sea, call CHEMTREC's international and maritime telephone number (collect calls accepted): +1 (703) 527-3887.

In Canada call CANUTEC: 1 613 996 6666

General Information: +1 800 244 6169 (Worldwide)

2. HAZARDS IDENTIFICATION

GHS



Danger

GHS05

Skin Corr. 1A H314 Causes severe skin burns and eye damage.
 Eye Dam. 1 H318 Causes serious eye damage.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.
 P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing.
 Rinse skin with water/shower.

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Material: Phosphoric Acid (35%-95%)

Reference No.: AST10046

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P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

3. COMPOSITION/INFORMATION ON INGREDIENTS**Composition**

<u>Substance</u>	<u>CAS No.</u>	<u>%w/w</u>	<u>EINECS No.</u>
Phosphoric Acid	7664-38-2	35 - 95	231-633-2
Water	7732-18-5	5 - 65	231-791-2

4. FIRST AID MEASURES**General**

This material is an acid; treatment is symptomatic and supportive. Phosphoric acid has irritating effects to mucous membranes.

Eye contact

Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove any contact lenses. Get medical attention. If irritation persists, contact an ophthalmologist.

Skin contact

May cause skin irritation. Wash effected area with plenty of soap and water. Get medical attention.

Inhalation

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion

IF SWALLOWED, do NOT induce vomiting. Give victim 2-4 glasses of water to drink. Get medical attention. Contact a Poison Control Center. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

5. FIRE FIGHTING MEASURES**Extinguishing media**

Not combustible. No special requirements.

Unsuitable extinguishing media

Non-combustible. No special requirements.

Exposure hazard

Not combustible. May give off toxic fumes (oxides of phosphorus) in a fire. May react with metals to liberate hydrogen, a flammable gas.

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Protective equipment

Firefighters should wear self-contained breathing apparatus & personal protective clothing (PPE).

6. ACCIDENTAL RELEASE MEASURES**Personal precautions**

Avoid unnecessary exposure and remove all material from eyes, skin and clothing. Do not ingest or inhale mists of phosphoric acid.

Environmental precautions

Small quantities: Avoid discharge into the environment

Large quantities: May cause pollution. Avoid discharge into the environment. Note methods for cleaning up in the next section.

Methods for cleaning up

Contain large spills with dikes and transfer the material to appropriate containers for reclamation or disposal. Absorb remaining material or small spills with an inert material and then place in a chemical waste container. Neutralize washings with a base such as soda ash or lime. Flush residual spill area with large amounts of water.

Refer to Section 13 for disposal information and Sections 14 and 15 for reportable quantity information.

7. HANDLING AND STORAGE**Handling**

Do not get in eyes, on skin, or on clothing.
Avoid breathing mist or vapor.
Do not taste or swallow.

Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Engineering measures

Provide natural or mechanical ventilation to minimize exposure. The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment. Consult National Fire Protection Association (NFPA) Standard 91 for design of exhaust systems.

Transfer product from drums to process in closed system (hermetically) and if not possible use effective local exhaust ventilation. Empty drums as thoroughly as possible to facilitate disposal.

For bulk transfer, purge lines with nitrogen to remove residual liquid before disconnect. When unloading bulk vehicles, personnel should wear chemical goggles and rubber or neoprene gloves. All fittings should be properly secured prior to energizing unloading system. Care should be taken to avoid acid contact when disconnecting lines/hoses after unloading.

For bulk storage type 316L stainless is recommended. Glass, polyethylene and FRP (depending on resin used) are satisfactory, steel, aluminum and type 304 stainless are not recommended because of rapid or potential corrosion. Vessels should be vented and operated at ambient conditions. Maintenance heat (hot water preferred) may be used to prevent freezing. Dike area around storage tank with sufficient volume to hold entire tank contents.

Storage

Store in plastic, rubber-lined, or 316L stainless steel tanks designed for Phosphoric Acid. Store drums away from heat and out of direct sunlight. Store in a well-ventilated dry area away from alkalis and most metals. Store above freezing point. Contact with reactive metals, i.e. mild steel and aluminum may generate hydrogen that may form an explosive mixture in storage vessels.

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For tank inspection, follow manufacturer's recommended safety guidelines (ex. temperature, etc.). In addition, corrosion data for phosphoric acid (ex. Handbook of Corrosion Engineering, McGraw-Hill, 2000) must be followed to match the storage container of choice (ex. stainless, rubber lined, etc.).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Occupational Exposure Limits**

<u>State</u>	<u>Standard</u>	<u>Limit</u>
Australia	Occupation Exposure Limit	1 mg/m ³ 8-hr. TWA, 3 mg/m ³ STEL
Austria	Occupation Exposure Limit	MAK 1 mg/m ³ 8-hr
Belgium	Occupation Exposure Limit	1 mg/m ³ 8-hr. TWA, 3 mg/m ³ STEL
Denmark	Occupation Exposure Limit	1 mg/m ³ 8-hr. TWA
Finland	Occupation Exposure Limit	1 mg/m ³ 8-hr. TWA, 3 mg/m ³ STEL
France	Occupation Exposure Limit	VME 1 mg/m ³ VLE 3 mg/m ³
Japan	Occupation Exposure Limit	1 mg/m ³ 8-hr.
United Kingdom	Occupation Exposure Limit	2 mg/m ³ STEL
United States	Occupation Exposure Limit	1 mg/m ³ 8-hr. TWA, 3 mg/m ³ STEL

Respiratory protection

Avoid breathing vapor or mist. Use NIOSH/MSHA approved respiratory protection equipment (full face piece recommended) when airborne exposure limits are exceeded (see below). If used, full-face piece replaces the need for face shield and/or chemical goggles. Refer to U.S. OSHA regulations 29 CFR 1910.134 or European Standard EN 149.

Hand/Skin protection

Wear impervious protective gloves and clothing to prevent contact to skin. Wash immediately if skin is contaminated. Remove contaminated clothing promptly and launder before reuse. Clean personal protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

Eye protection

Wear chemical goggles, a face shield, and if necessary, a full face respirator when conditions warrant or exceed the Occupation Exposure Limit. Refer to U.S. OSHA regulations 29 CFR 1910.133 or European Standard EN 166.

Components referred to herein may be regulated by specific Canadian provincial legislation. Please refer to exposure limits legislated for the province in which the substance will be used.

9. PHYSICAL AND CHEMICAL PROPERTIES

- a) Appearance: Clear, colorless, syrupy liquid
- b) Odor: None
- c) Odor threshold: Undetermined.
- d) pH: (as a 1% solution @ 25 °C) 75%:1.6; 80%:1.6; 85%:1.6; 95%:1.7
- e) Melting point/freezing point: Freezing point °C: 75%:-17.5; 80%:4.6; 85%: 21.1; 95%:24.7
- f) Initial boiling point and boiling range: (°C) 75%:135; 80%:144; 85%:154; 95%:202
- g) Flash point: Undetermined
- h) Evaporation rate: Undetermined.
- i) Flammability (solid, gas) : Undetermined.
- j) Upper/lower flammability or explosive limits: Undetermined.
- k) Vapor pressure: (100% acid): 0.0285 mm Hg @ 20 °C
- l) Vapor density: Undetermined.
- m) Relative density: @ 25/15.5 °C: 75%:1.575; 80%:1.633; 85%:1.692; 95%: 1.808
- n) Solubility(ies) : Complete
- o) Partition coefficient: n-octanol/water: Undetermined.

ICL Performance Products LP Safety Data Sheet

Material: Phosphoric Acid (35%-95%)

Reference No.: AST10046

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May 19, 2015

- p) Auto-ignition temperature: Undetermined.
 q) Decomposition temperature: Undetermined.
 r) Viscosity: @ 25 °C 75%:12; 80%:17; 85%:23; 95%:55

Chemical Formula: H_3PO_4

	75%	80%	85%	95%
% Equivalent H_3PO_4	75.1	80.35	85.5	95.0
Kg/l @ 25 °C	1.57	1.64	1.69	1.81
lb/gallon @ 25 °C	13.17	13.66	14.15	15 - 15.2

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Product is stable under normal conditions of storage and handling.

Conditions to avoid

Incompatible materials

Materials to avoid

Avoid contact with metals (such as mild steel and aluminum), which may liberate flammable hydrogen gas that can produce an explosion in confined vessels. Avoid contact with materials such as sulfides and sulfites, which could release toxic gases. Be cautious in mixing with strong bases because high heat of reaction can generate steam.

Hazardous decomposition

Phosphorus oxides may form when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Data from ICL Performance Products LP single-dose (acute) animal studies with this material are given below:

Phosphoric Acid 75%

Oral - rat LD₅₀: 4,400 mg/kg; slightly toxic
 Dermal - rabbit LD₅₀: > 3,160 mg/kg; slightly toxic
 Eye Irritation - rabbit (24-hr. exp): corrosive
 Skin Irritation - rabbit (24-hr. exp): corrosive
 DOT Skin Corrosion - rabbit (4-hr. exp): non-corrosive

Phosphoric Acid 80%

Oral - rat LD₅₀: 4,200 mg/kg; slightly toxic
 Dermal - rabbit LD₅₀: > 3,160 mg/kg; slightly toxic
 Eye Irritation - rabbit (24-hr. exp): corrosive
 Skin Irritation - rabbit (24-hr. exp): corrosive
 DOT Skin Corrosion - rabbit (4-hr. exp): non-corrosive

Phosphoric Acid 85%

Oral - rat LD₅₀: 3,500 mg/kg; slightly toxic
 Dermal - rabbit LD₅₀: > 1,260 mg/kg; slightly toxic
 Eye Irritation - rabbit (24-hr. exp): corrosive
 Skin Irritation - rabbit (24-hr. exp): corrosive
 DOT Skin Corrosion - rabbit (4-hr. exp): corrosive

ICL Performance Products LP Safety Data Sheet

Material: Phosphoric Acid (35%-95%)

Reference No.: AST10046

Page 6 of 7

May 19, 2015

The results of single exposure tests indicate that these concentrations of Phosphoric Acid are slightly toxic orally and no more than slightly toxic after skin application. Following a 24-hour exposure, irreversible eye and skin damage occurred at all tested concentrations of Phosphoric Acid.

Phosphoric Acid has produced no genetic changes in standard tests using bacterial cells.

Additional Information

This material is severely corrosive to steel based on DOT, 49 CFR criteria.

Phosphoric Acid has a low vapor pressure at room temperature and is not expected to present a significant inhalation hazard under ambient conditions. Phosphoric Acid can, however, be irritating to the respiratory tract if inhaled as a mist or if the material is vaporized. The American Conference of Governmental Industrial Hygienists (ACGIH) has established a Threshold Limit Value (TLV) for Phosphoric Acid. For further information on this material, please refer to the current edition of the Documentation of The Threshold Limit Values and Biological Exposure Indices.

12. ECOLOGICAL INFORMATION**Environmental toxicity**

Phosphoric acid is practically nontoxic to one species of freshwater fish. No toxicity data was located for other freshwater species, algae, or *Daphnia magna* in a search of the available scientific literature.

The following data have been classified using the criteria adopted by the European Economic Community (EEC) for aquatic organism toxicity.

96-hr. LC₅₀ Mosquitofish: 138 mg/L, practically nontoxic

Environmental Fate

No specific biodegradation test data was located in a search of the available scientific literature. It was reported in the literature that while acidity of this material may be reduced readily in natural waters, the phosphate may persist indefinitely.

13. DISPOSAL CONSIDERATIONS

This material when discarded is a hazardous waste as defined by the U.S. Resource Conservation and Recovery Act (RCRA), 40 CFR 261.22, due to its characteristic of corrosivity, EPA hazardous waste number D002. Best Demonstrated Available Treatment (BDAT) as defined by RCRA for D002 characteristic wastes is DEACTIVATION plus meet 40 CFR 268.48 (Universal Treatment Standards) for non-CWA/non-CWA equivalent/non-Class I SDWA systems. Dispose of in accordance with local, state and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Road/Rail, Sea and Air

IMDG/UN	UN 1805, Phosphoric acid, solution, 8, III
ICAO/IATA	UN 1805, Phosphoric acid, solution, 8, III
RID/ADR	UN 1805, Phosphoric acid, solution, 8, III
Canadian TDG	UN 1805, Phosphoric acid, solution, 8, III *
US DOT	UN 1805, Phosphoric acid, solution, 8, III *

*Reportable Quantity/ Reportable Limit (RQ/RL):

Canadian: Regulated limit (RL) for packages greater than or equal to 230 kg

U.S. DOT: Reportable quantity (RQ) for packages greater than or equal to 5,000 lb

ICL Performance Products LP Safety Data Sheet

Material: Phosphoric Acid (35%-95%)

Reference No.: AST10046

Page 7 of 7

May 19, 2015

15. REGULATORY INFORMATION**Chemical Inventory**

USA TSCA	Listed	Australia	Listed
Canada DSL	Listed	Korea	Listed
EC	Listed	Philippines	Listed
Japan	Listed	China	Listed

Additional information

WHMIS Classification: D2 (B) - Materials Causing Other Toxic Effects
E - Corrosive Material

SARA Hazard Notification

Hazard Categories Under Title III Rules (40 CFR 370):	Immediate
Section 302 Extremely Hazardous Substances:	Not Applicable
Section 313 Toxic Chemical(s):	Not Applicable

CERCLA Reportable Quantity: 5,000 lbs. of phosphoric acid

Release of 5,000 lbs. or more of this product into the environment in a 24-hour period requires notification to the U.S. National Response Center (800-424-8802 or 202-426-2675). Since local, state, and federal laws vary; consult your attorney or appropriate regulatory officials for information relating to spill reporting.

FDA: Food grades of phosphoric acid are sanctioned as Generally Recognized as Safe (GRAS) by the U.S. Food and Drug Administration and is codified in 21 CFR 182.1073.

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation and the MSDS contains all the information required by the Canadian Controlled Products Regulation.

Refer to Section 11 for OSHA/HPA Hazardous Chemical(s) and Section 13 for RCRA classification.

16. OTHER INFORMATION

	<u>Health</u>	<u>Fire</u>	<u>Reactivity</u>	<u>Additional Information</u>
Suggested NFPA Rating	3	0	0	
Suggested HMIS Rating	3	0	0	H H = Splash goggles, gloves (nitrile rubber recommended), synthetic apron, dust & vapor respirator

Reason for revision: Revised section 1 and 9. Supersedes MSDS dated: May 2, 2013
Responsible Care ® is a registered trademark of the American Chemistry Council.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, ICL Performance Products LP makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will ICL Performance Products LP be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS

AST10046.4090



The Public Health and Safety Organization

NSF Product and Service Listings

These NSF Official Listings are current as of **Wednesday, October 28, 2015** at 12:15 a.m. Eastern Time. Please contact NSF International to confirm the status of any Listing, report errors, or make suggestions.

Alert: NSF is concerned about fraudulent downloading and manipulation of website text. Always confirm this information by clicking on the below link for the most accurate information: <http://info.nsf.org/Certified/PwsChemicals/Listings.asp?CompanyName=ICL+Performance+Products+LP&ChemicalName=Phosphoric+Acid&ProductFunction=Corrosion+Control&>

NSF/ANSI 60 Drinking Water Treatment Chemicals - Health Effects

ICL Performance Products LP

622 Emerson Road

St. Louis, MO 63141

United States

314-983-7500

Visit this company's website (<http://www.icl-pplp.com>)

Facility : Lawrence, KS

Phosphoric Acid

Trade Designation

Phosphoric Acid 36%-38% - Food Grade
Phosphoric Acid 36%-38% - Technical Grade
Phosphoric Acid 70% Food Grade
Phosphoric Acid 70% Technical Grade
Phosphoric Acid 75% - Food Grade
Phosphoric Acid 75% - Technical Grade
Phosphoric Acid 80% - Food Grade
Phosphoric Acid 80% - Technical Grade
Phosphoric Acid 85% - Food Grade
Phosphoric Acid 85% - Technical Grade
Thermal Select 75%
Thermal Select 80%
Thermal Select 85%

Product Function

Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control

Max Use

27 mg/L
27 mg/L
14mg/L
14mg/L
13 mg/L
13 mg/L
12 mg/L
12 mg/L
12 mg/L
12 mg/L
13mg/L
12mg/L
12mg/L

Facility : St. Louis, MO

Phosphoric Acid

Trade Designation

36-38% Food Grade
 36-38% Technical Grade
 75% Food Grade
 75% Technical Grade
 80% Food Grade
 80% Technical Grade
 85% Food Grade
 85% Technical Grade

Product Function

Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control

Max Use

27 mg/L
 27 mg/L
 13 mg/L
 13 mg/L
 12 mg/L
 12 mg/L
 12 mg/L
 12 mg/L

Facility : Carteret, NJ**Phosphoric Acid****Trade Designation**

Phosphoric Acid 36%-38% - Food Grade
 Phosphoric Acid 36%-38% - Technical Grade
 Phosphoric Acid 50% - Food Grade
 Phosphoric Acid 50% - Technical Grade
 Phosphoric Acid 75% - Food Grade
 Phosphoric Acid 75% - Technical Grade
 Phosphoric Acid 80% - Food Grade
 Phosphoric Acid 80% - Technical Grade
 Phosphoric Acid 85% - Food Grade
 Phosphoric Acid 85% - Technical Grade

Product Function

Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control

Max Use

27 mg/L
 27 mg/L
 20mg/L
 20mg/L
 13 mg/L
 13 mg/L
 12 mg/L
 12 mg/L
 12 mg/L
 12 mg/L

Facility : Distribution Center - 1 USA**Phosphoric Acid****Trade Designation**

Phosphoric Acid 35%-85%

Product Function

Corrosion & Scale Control

Max Use

12mg/L

Facility : Distribution Center - 12 USA**Phosphoric Acid****Trade Designation**

70% Phosphoric Acid - Food Grade
 70% Phosphoric Acid - Technical Grade
 75% Phosphoric Acid - Food Grade
 75% Phosphoric Acid - Technical Grade
 80% Phosphoric Acid - Food Grade
 80% Phosphoric Acid - Technical Grade
 85% Phosphoric Acid - Food Grade
 85% Phosphoric Acid - Technical Grade
 P2O5 Thermal Intermediate
 Thermal Select 75%

Product Function

Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control
 Corrosion & Scale Control

Max Use

14mg/L
 14mg/L
 13mg/L
 13mg/L
 12mg/L
 12mg/L
 12mg/L
 12mg/L
 13mg/L
 13mg/L

Facility : Distribution Center - 13 USA**Phosphoric Acid****Trade Designation****Product Function****Max Use**

70% Phosphoric Acid - Food Grade

Corrosion & Scale Control

14mg/L

70% Phosphoric Acid - Technical Grade

Corrosion & Scale Control

14mg/L

75% Phosphoric Acid - Food Grade

Corrosion & Scale Control

13mg/L

75% Phosphoric Acid - Technical Grade

Corrosion & Scale Control

13mg/L

80% Phosphoric Acid - Food Grade

Corrosion & Scale Control

12mg/L

80% Phosphoric Acid - Technical Grade

Corrosion & Scale Control

12mg/L

85% Phosphoric Acid - Food Grade

Corrosion & Scale Control

12mg/L

85% Phosphoric Acid - Technical Grade

Corrosion & Scale Control

12mg/L

Facility : Distribution Center - 15 USA**Phosphoric Acid****Trade Designation****Product Function****Max Use**

75% Phosphoric Acid - Food Grade

Corrosion & Scale Control

13mg/L

75% Phosphoric Acid - Technical Grade

Corrosion & Scale Control

13mg/L

85% Phosphoric Acid - Food Grade

Corrosion & Scale Control

12mg/L

85% Phosphoric Acid - Technical Grade

Corrosion & Scale Control

12mg/L

Facility : Distribution Center - 2 USA**Phosphoric Acid****Trade Designation****Product Function****Max Use**

Phosphoric Acid 75%

Corrosion & Scale Control

13mg/L

Facility : Distribution Center - 4 USA**Phosphoric Acid****Trade Designation****Product Function****Max Use**

70% Phosphoric Acid - Food Grade

Corrosion & Scale Control

14mg/L

70% Phosphoric Acid - Technical Grade

Corrosion & Scale Control

14mg/L

75% Phosphoric Acid - Food Grade

Corrosion & Scale Control

13mg/L

75% Phosphoric Acid - Technical Grade

Corrosion & Scale Control

13mg/L

80% Phosphoric Acid - Technical Grade

Corrosion & Scale Control

12mg/L

85% Phosphoric Acid - Food Grade

Corrosion & Scale Control

12mg/L

85% Phosphoric Acid - Technical Grade

Corrosion & Scale Control

12mg/L

Facility : Distribution Center - 6 USA**Phosphoric Acid****Trade Designation**

70% Phosphoric Acid - Food Grade
70% Phosphoric Acid - Technical Grade
75% Phosphoric Acid - Food Grade
75% Phosphoric Acid - Technical Grade
80% Phosphoric Acid - Food Grade
80% Phosphoric Acid - Technical Grade
85% Phosphoric Acid - Food Grade
85% Phosphoric Acid - Technical Grade

Product Function

Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control
Corrosion & Scale Control

Max Use

14mg/L
14mg/L
13mg/L
13mg/L
12mg/L
12mg/L
12mg/L
12mg/L

Facility : M.P. Arava, Israel**Phosphoric Acid****Trade Designation**

Orthophosphoric Acid 93%
Phosphoric Acid Food Grade 93%

Product Function

Corrosion & Scale Control
Corrosion & Scale Control

Max Use

12mg/L
12mg/L

Number of matching Manufacturers is 1

Number of matching Products is 72

Processing time was 0 seconds

Requested By	Client Name	Desk Phone #	Cell Phone #	Client User ID
Melissa Charbonneau	Megan McMahon	517-284-6668	517-230-3442	MCMAHONM1
Melissa Charbonneau	Carla Davidson	517-284-6663	517-243-1249	DAVIDSONC
Melissa Charbonneau	Susan Doty	517-284-6664	517-230-1430	DOTYS2
Melissa Charbonneau	Brent Bodnar	517-284-6661	517-243-8011	BODNARB
Melissa Charbonneau	Justin Smith	517-284-6669	517-230-4675	SMITHJ8

* WTP needs to ATM what its ability is for on cor-
 control on KWA - registers of getting KWA water to
 WTP prior to switch
 - Before KWA - hard what needs to be done?
 How do we accomplish this? $\nearrow$ pH control
 How to ATM
 optimize
 it starts
 test loop

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

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

Here's what we plan to say to Flint / want EPA to concur

- Dosage > 1 as P @ 1 in dist
- Feed at higher rate to get 1.0 mg/l @ 1 in dist
- go to 25 sites - hard what we have samples $\nearrow$

short term - start work on
 our plan to Flint

Long term - use P & ROCC
 sites / action to do CM

Meet w.
 city to
 discuss
 F. EPA. vs
 - then some pipelap / for tests
 specific

EPA CALL RE CORROSION CONTROL 10/20/15.
Proposal.

① Exposure as PO₄ in the water - yes

- EPA 1000. MUM - we will confirm

② EPA wants 3-4 mg/l as PO₄ - yes
wants to estab. 1.0 mg/l as P in Dist.

- Need more ~~test~~ in system, but maintain 1.0 mg/l

NSE limits
Pot @ DWSD → 12 mg/l MAX OASO (AS prod?) - P look to confirm

EPA wants quick JAR test to verify no sig. pH Δs

③ - Regarding the testing / - we have parameters that can be collated
we have 45 sites for WA
PH, ALK, ORTHO, TUB? FC? → CAN ADD these too
Cl, Cond, Temp

we have prior ^{Rule} data from when FMT was in DWSD
+ 100 data

are ANY/TC PTS the WQ parameter Pt? - we will verify
aligns to target are outlined CI

④ we can work on TAC - to do the mini study
8-10 sites

DHHS - looking @ exposure Assessment too - basic understanding
Blood testing @ school / Elevated levels → Assess hemoc - BB serum
PAINT
Soil

- Agree that EPA needs to work w. DHHS / contact?
I.E. how much load is coming from various parts of services
E & O + the best P4 dosage - diagnostic sampling to track

Timing to complete? Enter the battery - Q114 took 7

EPA can help to ~~an~~ assist city / confirm start now
load services - w. test results
A service line test loops
can also be installed

Diagnostic

Comments RE CORROSION Control

1. Establish Phosphoric Acid dose at no less than 1.0 mg/l as P (3.2 mg/l as P_2O_5) AS
modeled
2. Dose PO_4 Product at a rate > 1.0 mg/l as P $\checkmark$ to establish minimum. ~~of~~ distribution residuals at 1.0 mg/l as P (3.2 mg/l as PO_4)
3. Re-establish WQP monitoring at the 25 locations previously used when on Detroit water. In addition to monitoring for the parameters called out in the L.R., include the parameters for turbidity, iron, & chlorine
4. Conduct JAR test at proposed dosage to verify optimal pH range is maintained
5. Provide Product cut-sheet showing MAX. dosage and NSF Std 60 certification

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

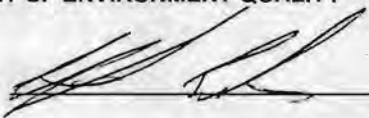
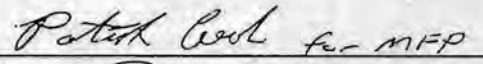
PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS
(CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Environmental Quality (DEQ) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint 4500 North Dort Highway Flint, MI 48505 WSSN: 02310	Permit Stamp Area (DEQ use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. 140026 APR 09 2014 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976	
2. Owner's Contact Person (provide name for questions): Contact: Brent Wright Title: Plant Supervisor Phone: 810-787-6537		
3. Project Name (Provide phase number if project is segmented): Flint WTP Phase II, Segment II - Lime Residual Disposal	4. Project Location (City, Village, Township): City of Flint	5. County (location of project): Genesee County

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENT QUALITY

cc:

Issued by: Reviewed by: 

for Mike Prusky

☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DEQ District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions will be returned. SEE EXAMPLES BELOW. Use additional sheets if needed.

Improvements to the City of Flint Lime Sludge Lagoons at Bray Road to allow lime sludge from the the Flint WTP to be stored during the interim period when the plant will be treating Flint River water. The lagoons will not be needed for continuous use when the plant switches to treatment of raw water from the KWA Lake Huron Water Supply:

PHASE II, SEGMENT II - LIME RESIDUAL DISPOSAL (@BRAY ROAD):

- * Plugging and abandonment of 8" inlet piping; construction of 306 LF of new 10" inlet piping; installation of bulkhead on existing outlet structure to prevent discharge to surface water.
- * Clay Berm barrier improvements to separate concrete debris pile from lime sludge.
- * Construction of new decant tower structure, 8" gravity sewer, and decant pump station (duplex submersible) with CO2 feed system for pH adjustment. Vortex impeller pumps (2) shall each be rated at 140 gpm at 22' TDH; CO2 feed consists of 6 ton storage tank, 15 pph pH controlled feed system, SS gas piping, and diffusers installed in the decant tower.
- * Construction of approx. 3,800 LF of 6" HDPE decant forcemain and connection to existing City sanitary sewer system.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address:

Jeremy N. Nakashima, PE
Lockwood, Andrews & Newnam, Inc.
1 Oakbrook Terrace, Suite 207
Oakbrook Terrace, IL 60181
630-495-4123 / jnnakashima@lan-inc.com

8. Indicate who will provide project construction inspection:

- ☒ Organization listed in Box 1.
☒ Engineering firm listed in Box 7.
☐ Other - name, address, and phone number listed below.

9. Is a basis of design attached?

☒ YES ☐ NO

If no, briefly explain why a basis of design is not needed. Submitted previously under separate cover.

10. Are sealed and signed engineering plans attached?

☒ YES ☐ NO

If no, briefly explain why engineering plans are not needed. Plans and specs submitted previously under separate cover.

11. Are sealed and signed construction specifications attached?

☒ YES ☐ NO

If specifications are not attached, they need to be on file at DEQ.

12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed?

☒ YES ☐ NO

If no, explain which deviations were made and why.

13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved?

☒ YES ☐ NO

If no, describe what coatings, additives or materials did not meet the applicable standard and why.

14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement?
(For projects not located in the public right-of-way, utility easements must be shown on the plans.)

☐ YES ☒ NO

If no, explain how access will be obtained. Most work will be on City owned property, except forcemain.

15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451?

☐ YES ☒ NO

If yes, a wetland permit must be obtained.

16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules?

☐ YES ☒ NO

If yes, a flood plain permit must be obtained.

17. Is the project construction activity within 500 feet of a lake, reservoir, or stream?

☒ YES ☐ NO

If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?
☐ YES ☒ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☐ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES ☒ NO

If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) _____

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☐ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DEQ.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, BRENT F. WRIGHT (name), acting as the WATER PLANT SUPERVISOR (title/position) for

(print)

(print)

CITY OF FLINT

(print)

(entity owning proposed facilities) certify that this project has

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.



Signature*

3-31-2014

Date

(810) 787-6537

Phone

*Original signature only, no photocopies will be accepted.

Permit Application for Water Systems (Continued)

PROJECT BASIS OF DESIGN – FOR WATER MAIN PROJECTS

PROJECT NAME: _____

For this PROJECT the following information must be provided per Act 399 unless waived by the Department. For projects other than water main installation, or if additional space is needed, attach separate sheet(s) with detailed Basis of Design calculations.

- A. A general map of the initial and ultimate service areas
☐ Included on engineering plans ☐ Attached separately
- B. Number of service connections served by this permit application _____
- C. Total number of service connections ultimately served by entire project _____
- D. Residential Equivalent Units (REUs) served by this permit application _____
- E. Total Residential Equivalent Units (REUs) ultimately served by entire project _____
- F. Water flow rates for proposed project based on REUs listed in "D" and "E" above
1. Initial design average day flow (mgd) _____
 2. Initial design maximum day flow (mgd) _____
 3. Total design average day flow (mgd) _____
 4. Total design maximum day flow (mgd) _____
 5. Required fire flows: ⁽¹⁾ _____ gpm for _____ hours
- G. Actual flows and pressures of existing system at the connection point(s) ⁽²⁾
- | |
|------------------------|
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
- H. Estimated minimum flows and pressures within the proposed water main system ⁽³⁾
- _____ gpm at _____ psi

(1) Every water system must decide what levels of fire fighting flows they wish to provide. Fire flow should be appropriate for the area (residential, commercial, industrial) being served by the project. Typical fire flow rates can be obtained from the water supply, local fire dept., ISO or AWWA. The water system must then be designed to be able to provide the required fire flows while maintaining at least 20 psi in all portions of the distribution system.

(2) Flows and pressures at the connection points must be given to determine if the existing water main(s) are able to deliver water to the new service area. These numbers can be obtained from a properly modeled and calibrated distribution system hydraulic analysis or hydrant flow tests performed in the field. If more than one connection is proposed, list as needed.

(3) List what the estimated minimum flows can be expected in the proposed water mains based on estimated water demands, head losses, elevation changes and other factors that may affect flows, such as dead end mains.

**Flint WTP Improvements – Phase II, Segments I, II, and III
Responses to MDEQ Review Comments dated 4-3-2014**

The MDEQ review comments dated 4-3-14 have been addressed as noted in the responses below. Revised drawings have also been prepared in conjunction with these responses and have been included in the attached revised drawing sets for Phase II, Segments I, II, and III.

DEC
RESOURCE MANAGEMENT DIVISION

APR 08 2014

LANSING DISTRICT

Phase II – Segment 1 - Watermain Cut-in Plans

- **Mid-Pt Chlorination - update plans to depict the additional anti-siphon/ball valve as described in your response to our March 19, 2014 comments. Most likely to be added to Sheet C-508.**

Response: The anti-siphon/ball valve is shown on revised Sheet C-104, dated 4-7-14.

- **Include a full-sized mid-point chlorination system schematic with the updated plans.**

Response: The mid-point chlorination system schematic has been included in the Phase II, Segment I – Initial Watermain Cut-in drawings as Sheet C-509, dated 4-7-14.

- **It appears that make-up water and chlorine gas are not combined at the chlorine feeder (panel w. rotometer, vacc. monitor, auto. feed control valve, etc.) for production of liquid chlorine. Instead, this appears to take place at the ejector/check valve assembly on the plant supply line. Please confirm. If gas under vacuum is conveyed to the ejector at the plant supply line, the gas piping must be Schedule 80 seamless steel tubing. Please confirm. This can be included on the chlorination system schematic.**

Response: The above description of the midpoint chlorination system is essentially correct. As shown on Sheet C-509, the mid-point chlorination system is a vacuum system. The vacuum regulators are mounted directly to the chlorine storage cylinders. Vacuum lines run from the regulators to the chlorinator control panels where feed rate is controlled. Vacuum lines are then connected from the control panel to ejectors, where water supply flowing through the ejectors creates the vacuum required to pull gas from the storage tanks. While the ejectors are not located in the control panel, it is common to have the ejectors remotely mounted from the control panels. A review of the 10 State Standards requirement for Schedule 80 seamless steel tubing appears to be for pressure gas feed systems, and not vacuum gas feed systems as proposed for Flint. As such, the recommended vacuum line material for a 500

ppd system is 5/8" O.D. flexible polyethylene plastic tubing (see attached information from Hydro Instruments).

Please provide 2 full-sized sets of Watermain Cut-in Plans that include the requested information and revisions.

Phase II - Segment 1 - WTP Rehabilitation Plans

- **LOX/LN Storage & Piping – update plans to depict revised sheets D2-102 and D2-601. The revisions were made to clarify the gas piping configuration.**

Response: Revised drawings D2-101, D2-102, D2-301, D2-502, and D2-601 have been included in the updated plan set.

- **The existing LOX storage tank will provide approximately 16 days storage at max design rate at 12.0 MGD until the second tank is installed. The Act 399 permit will be issued with a condition that the MDEQ is provided a copy of the contract between the city and the LOX supplier that specifies the maximum delivery time. The LOX system shall be operated such that a minimum of 5 days storage is maintained in the LOX tank at all times.**

Response: The City will provide MDEQ a copy of the contract between the City and their LOX supplier under separate cover. LOX can be supplied within 24 hours of when a purchase order is issued.

- **Mid – Point Chlorination (Chlorine room) - revise sheets C5-105 and C5-508 to show deletion of the chlorine gas scrubber system.**

Response: Sheets C5-105, C5-508, and EP6-101, which are all specific to the chlorine scrubber work only, have been deleted in their entirety from the updated plan set.

- **Revise the ventilation intake duct detail (Sheet C5-508) to as described in your response.**

Response: This intake duct detail is no longer applicable as it is for the chlorine scrubber system, which has been deleted. As noted in the previous MDEQ review comment responses, the City will extend the existing ventilation intake ductwork in the existing Chlorine Storage Room to finished floor level. This work has been added to the Phase II, Segment I – Initial Watermain Cut-in plan set, see Note 7 of revised drawing Sheet C-103.

- **Add panic hardware to chlorinator room door (east and west exits).**

Response: The City will perform this work. This work has been added to the Phase II, Segment I – Initial Watermain Cut-in plan set, see Note 8 of revised drawing Sheet C-103.

- **The existing door between P.S. 4 and the chlorine gas storage room should be closed off such that the chlorine gas storage room and chlorinator room are only assessable from the outside. Although an improved door sweep is proposed, door sweeps are not failsafe in a catastrophic gas release and such an event could jeopardize the entire P.S. #4.**

Response: The City will perform this work. This work has been added to the Phase II, Segment I – Initial Watermain Cut-in plan set, see notes on revised drawing Sheet C-103.

- **Raw Water Piping – the proposed 54X42 cross provides minimal vertical separation (approximately 6-inches). A pair concrete cradles installed on each side of the 54-inch concrete main will mitigate the force of the 42-inch main installed above at the crossing. A condition will be added to the Act 399 permit to field adjust the 42-inch main installation to maximize the vertical separation at the crossing.**

Response: The Contractor is required to field verify the elevation of the existing 54" pipeline. The City or the City's representative onsite observing construction will coordinate with the Contractor to ensure that the clearance between the 42" and 54" pipelines is increased to the maximum extent practical.

Please provide 2 full-sized sets of WTP Rehabilitation Plans that include the requested information and revisions.

Phase II – Segment 2 - Bray Road Sludge Lagoon

Provide 2 full-sized sets of construction plans for proposed work at the Bray Road sludge lagoon. Separation between the concrete disposal area the lime sludge disposal area by metal sheet piling, as discussed in our meeting, needs to be depicted.

Response: 2 full sized sets of construction plans of proposed work at the Bray Road Sludge Lagoon are included for your review and file. The separation barrier between the concrete disposal area and the lime sludge disposal area will be accomplished by

establishing a clay barrier that extends to the bottom of the original lagoon bottom as shown in the detail on sheet C-501. The separation barrier will be constructed within the lime sludge lagoon away from the concrete disposal area as to provide complete separation as discussed.

Prepare final Bray Road Lime Sludge Management Plan. The plan also needs to include establishment of a level working surface in the west portion of the lagoon and removal of the island.

Response: A final version of the Bray Road Lime Sludge Management Plan is being included with this final submittal. A level working surface of 738.5' has been designated within the sludge lagoon after the pump station is operational. All debris or vegetation growth within the 742' elevation within the sludge lagoon is intended to be removed and cleared by the contractor.

The Act 399 permit will also include a condition requiring the sheet piling to be driven deep enough into native soil to maintain its structural integrity for removal of waste material on the exterior portion of the lagoon.

Response: Sheet piling is no longer being used as the separation barrier based on further discussion with the contractor and availability. A clay berm will be constructed for the full depth within the lime sludge lagoon using the original bottom of the sludge lagoon as a base using the proposed alignment proposed for the sheet piling.

Act 399 Permit Applications:

WTP Rehabilitation:

Part 6 (Facilities Description) needs to discuss the provisions for the stand-by generator. The description needs to be added in the Phase II – Segment III – Electrical Improvements (@WTP) – (i.e. transfer switch, universal generator connection)

Response: See attached revised Part 6 of the Act 399 Permit Application forms.

Bray Road (Flint WTP Phase II, Segment II – Lime Residual Disposal)

Please revise Part 6 (Facilities Description) since a berm-liner system will not be used to separate the lime sludge area from the concrete debris area. Eliminate "Berm/liner" from the statement: "Berm/liner or Sheet Piling improvements to separate concrete debris from lime sludge."

Response: See attached revised Part 6 of the Act 399 Permit Application forms.



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

TRANSMITTAL

Filing Data Code 1-07

PLANNING

ENGINEERING

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To: Mr. Steve Busch, PE		Date 4-8-14	
Company: MDEQ		Project Number 130-10701-001	
Address: 525 WEST ALLEGAN STREET Lansing, MI 48933		Routing:	
Project: City of Flint Water Treatment Plant Improvements.			
We Are Sending You: ☐ Shop Drawings ☐ Original Drawings ☒ Prints ☐ Specifications ☐ Reports ☐ Submittal Data ☐ Proposal ☐ As Noted		These Are Transmitted: ☐ As Requested ☒ For Your Use ☒ For Review and Comment ☐ For Your Signature	

Quantity	Description
2	22x34 Plans - Phase II, Segment 1 - Rehabilitation
2	22x34 Plans - Phase II, Segment 1 - Initial Watermain Cut-In
2	22x34 Plans - Phase II, Segment II - Lime Residual Disposal
2	Final Bray Road Lime sludge management Plan
1	Updated page 2 for permit applications
1	LAN Team Response to MDEQ Review comments

Remarks

These plans are being submitted for permit issuance as discussed.

DEC

RESOURCE MANAGEMENT DIVISION

APR 08 2014

LANSING DISTRICT

Distribution

Prepared By

- 1- Daugherty Johnson
- 2- Brent Wright
- 3- File

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**Flint WTP Improvements
Phase II
Segments I-III
MDEQ Comments
April 3, 2014**

Phase II – Segment 1 - Watermain Cut-in Plans

- Mid-Pt Chlorination - update plans to depict the additional anti-siphon/ball valve as described in your response to our March 19, 2014 comments. Most likely to be added to Sheet C-508.
- Include a full-sized mid-point chlorination system schematic with the updated plans.
- It appears that make-up water and chlorine gas are not combined at the chlorine feeder (panel w. rotometer, vacc. monitor, auto. feed control valve, etc.) for production of liquid chlorine. Instead, this appears to take place at the ejector/check valve assembly on the plant supply line. Please confirm. If gas under vacuum is conveyed to the ejector at the plant supply line, the gas piping must be Schedule 80 seamless steel tubing. Please confirm. This can be included on the chlorination system schematic.

Please provide 2 full-sized sets of Watermain Cut-in Plans that include the requested information and revisions.

Phase II - Segment 1 - WTP Rehabilitation Plans

- LOX/LN Storage & Piping – update plans to depict revised sheets D2-102 and D2-601. The revisions were made to clarify the gas piping configuration.
- The existing LOX storage tank will provide approximately 16 days storage at max design rate at 12.0 MGD until the second tank is installed. The Act 399 permit will be issued with a condition that the MDEQ is provided a copy of the contract between the city and the LOX supplier that specifies the maximum delivery time. The LOX system shall be operated such that a minimum of 5 days

Act 399 Permit Applications:**WTP Rehabilitation:**

Part 6 (Facilities Description) needs to discuss the provisions for the stand-by generator. The description needs to be added in the Phase II – Segment III – Electrical Improvements (@WTP) – (i.e. transfer switch, universal generator connection)

Bray Road (Flint WTP Phase II, Segment II – Lime Residual Disposal)

Please revise Part 6 (Facilities Description) since a berm-liner system will not be used to separate the lime sludge area from the concrete debris area. Eliminate "Berm/liner" from the statement: "Berm/liner or Sheet Piling improvements to separate concrete debris from lime sludge."

storage is maintained in the LOX tank at all times.

- Mid – Point Chlorination (Chlorine room) - revise sheets C5-105 and C5-508 to show deletion of the chlorine gas scrubber system.
- Revise the ventilation intake duct detail (Sheet C5-508) to as described in your response.
- Add panic hardware to chlorinator room door (east and west exits).
- The existing door between P.S. 4 and the chlorine gas storage room should be closed off such that the chlorine gas storage room and chlorinator room are only assessable from the outside. Although an improved door sweep is proposed, door sweeps are not failsafe in a catastrophic gas release and such an event could jeopardize the entire P.S. #4.
- Raw Water Piping – the proposed 54X42 cross provides minimal vertical separation (approximately 6-inches). A pair concrete cradles installed on each side of the 54-inch concrete main will mitigate the force of the 42-inch main installed above at the crossing. A condition will be added to the Act 399 permit to field adjust the 42-inch main installation to maximize the vertical separation at the crossing.

Please provide 2 full-sized sets of WTP Rehabilitation Plans that include the requested information and revisions.

Phase II – Segment 2 - Bray Road Sludge Lagoon

Provide 2 full-sized sets of construction plans for proposed work at the Bray Road sludge lagoon. Separation between the concrete disposal area the lime sludge disposal area by metal sheet piling, as discussed in our meeting, needs to be depicted.

Prepare final Bray Road Lime Sludge Management Plan. The plan also needs to include establishment of a level working surface in the west portion of the lagoon and removal of the island.

The Act 399 permit will also include a condition requiring the sheet piling to be driven deep enough into native soil to maintain its structural integrity for removal of waste material on the exterior portion of the lagoon.

Flint WTP Improvements
Phase II
Segments I-III
MDEQ Comments
March 19, 2014

Segment 1 - Cut-in Piping

The detail shows air-release manholes with corp. stops? How will the air release operation be executed? Means to drain the manhole?

Written response needed.....

Segment 1 - WTP Rehab

1. Raw Water Piping - Maintain back-up supply from Gen Co. during interim operation at C.S. #2. Sheet C5-102

54X42 cross (Sheet C5-501 & C5-101) only 6-inches - Support?

Air-release manhole - same as Cut-in piping

Current yard piping diagram?

Written response needed on the first 3 items. Yard piping diagram will be a work in progress.

2. Mid-Point CL2 - Basis of design provided

- Scale - use existing or proposed? If proposed - type, capacity
- Scrubber?
- Room air-exchange rate ?
- Pipe penetrations - discuss protective seal
- Floor drains - discuss
- Door sweep - discuss
- Scrubber piping - lower intake

810 516 6793

- Check valve/anti-siphon at influent channel - include in final

3. High Service Pump

Will mechanical ball valve operate like a check valve in event of unexpected pump shut-down?

TDH of current pump and proposed pump?

Conformance of proposed pump TDH with system head curve?

Written response needed.....

4. LOX/LN Storage

Piping configuration clarified

The LN calculation (71 ppd) is not clear. Is there a % concentration or transfer efficiency?

5. Electrical improvements

Are operation of the pumps being split with the MCC or are multiple MCCs being provided?

Written response needed.....

**Flint WTP Improvements
Phase II
Segments I-III
MDEQ Comments
February 27, 2014**

2 FRANK
- ACCESS
- MANHOLE A.R. LINE
TO CONNECT TO CORP
TO ACCESS A.R.
JULY FOLLOWING

Segment 1 - Cut-in Piping

- ✓ The detail shows air-release manholes with corp. stops? How will the air release operation be executed? Means to drain the manhole?

Segment 1 - WTP Rehab

→ Pump em down

- ✓ 1. Raw Water Piping - Maintain back-up supply from Gen Co. during interim operation at C.S. #2. Sheet C5-102
- ✓ 54X42 cross (Sheet C5-501 & C5-101) only 6-inches - Support? *Not 60" or 1.11*
- ✓ Air-release manhole - same as Cut-in piping *just pull up*
- maximize the available*
- same design*
- Current yard piping diagram? - *work in progress*

2. Mid-Point CL2 - Basis of design needed

- Application rate (both mid-pt & post for CT)
- CL2 gas max dosage LBS/Day
- Scale - type, capacity ✓ *4 new scale tanks inst.*
- Rotometer (lbs/day)
- Vacc reg, injector, educator (size)
- Scrubber capacity - *not being detailed*
- Room air-exchange rate *1/3.3 min*
- Pipe penetrations - Sheet C-103 - linkseal - gas resistant? - *will inspect & seal*
- Floor drains - *to be plugged*
- Door sweep - *new better sealing sweeps to be provided*
- Safety features - obs window, fan, lights, switches, panic bar
- Scrubber piping - lower intake → *will extend to floor w. 90° bend*
- Check valve/anti-siphon at influent channel - *yes*

hydraulic outwork
 will close on system
 failure / shut-down

3. High Service Pump

Will mechanical ball valve operate like a check valve in event of unexpected pump shut-down?

185

TDH of current pump and proposed pump?

Conformance of proposed pump TDH with system head curve?

will match w. smaller pump

4. LOX/LN Storage

LOX & LN piping clarification – Sheet D2-102 & D2-601

BOD for storage

Ozone was designed at 4.0 mg/l max dose @ 36 MGD (Sec. 3.5 WTP BOD)

Ozone max dose at 18.0 MGD is 650 Lbs/day

How many GPD does this equate to?

5. Electrical improvements

Are operation of the pumps being split with the MCC or are multiple MCCs being provided?

One switchgear - dual feed
 Two breakers - Kerkley

Flint WTP Improvements – Phase II, Segments I, II and III

Responses to MDEQ Review Comments dated 3/19/2014

Segment I – Initial Watermain Cut-in

- ✓ 1. Detail 2, Sheet C-504, "Air Release & Access Manhole," shows a 2" corp stop for air release. These are intended to be manual air release valves for exhausting air upon initial filling of the pipeline or after maintenance has been performed and refilling the pipeline. The manhole structure will be checked periodically and pumped out with a portable sump pump as part of the normal plant maintenance program.

Segment I – Rehabilitation

1. Raw Water Piping

- ✓ a. Maintain back up supply from Genesee County during interim operation at C.S. #2. Installation of the 42" raw water piping has been delayed until the KWA project is closer to being ready to supply water to the City. This will allow the City to maintain the backup supply from Genesee County during interim operation.
- b. The crossing of the new 42" steel pipe over the existing 54" concrete pipe is shown in plan on drawing sheet C5-101, with Detail 5, Sheet C5-501 showing how the 42-inch line will be supported. As shown on Detail 5, Sheet C5-501, the new 42-inch line will have concrete pipe cradles constructed on either side of the existing 54" pipe, maintaining a minimum clearance of 12" on either side of the 54" pipe. Pipe loads from the 42" line will then be transferred to the pipe cradles and into the soil, and not the 54" pipe. The 6" clearance between the two pipes will be backfilled with CLSM material as it will be impossible to compact typical granular bedding material under the 42" pipe.
- c. Detail 2, Sheet C5-505, "Air Release & Access Manhole," shows a 2" corp stop for air release. These are intended to be manual air release valves for exhausting air upon initial filling of the pipeline or after maintenance has been performed and refilling the pipeline. The manhole structure will be checked periodically and pumped out with a portable sump pump as part of the normal plant maintenance program.
- d. See attached color coded yard piping diagram.

2. Midpoint Chlorination

- a. Four (4) new scales will be provided for monitoring chlorine usage from ton containers. Scales shall be as manufactured by Scaletron Industries Ltd. with a load range of 0 to 4000 lbs.
- b. The City has not been able to determine that the chlorine scrubber is a requirement of any applicable code. At this time, the City will not be installing the chlorine scrubber shown on the design drawings and will rely on the existing ventilation system to exhaust air from the Chlorine Storage Room.
- c. The existing ventilation in the Chlorine Storage Room was tested to have a capacity of 18.3 air changes per hour, or 0.305 air changes per minute. Therefore, one room volume air

change would take approximately 3.3 minutes with the current ventilation system. See attached test results. Due to the size of the existing Chlorine Storage Room, a ventilation system of 1 air change per minute is not practical. While the existing ventilation system capacity is less than 1 air change per minute, it appears to be in compliance with 10 State Standards as lesser rates may be considered in cases where 1 air change per minute is not appropriate due to the size of the room.

- d. WTP staff will identify and inspect all proposed and existing piping and conduit wall penetrations in the Chlorine Storage Room and seal as necessary to prevent gas leakage into other parts of Pump Station No. 4.
 - e. Existing floor drains in the Chlorine Storage Room were for condensate from the old chlorine evaporator system. These drains will no longer be used and will be plugged by WTP staff.
 - f. WTP staff will attach new door sweeps with better seals at existing doors as required.
 - g. WTP staff will extend existing ventilation intake ductwork to finished floor level with 90-degree bends.
 - h. Per Addendum No. 1, an Anti-siphon / Back Pressure Valve and additional ball valve shall be added just prior to the trough wall penetration. The anti-siphon / back pressure valve shall be PVC and designed for use with chlorine systems. The valve shall be a LMI #35856, Walchem E90422, or engineer approved equivalent. The valve shall be installed between the two ball valves to allow for isolation during servicing. The valve shall be located above the high water level in the trough. The Contractor shall install a 1" drain line from the relief port to the finished floor elevation of the pipe gallery.
3. High Service Pump
- a. The new 16" pump control ball valve for HSP #1 replaces the existing pump control ball valve in kind and will operate in the same manner as the existing valve. The valve will act like a check valve upon emergency shutdown of the pump through the use of a hydraulic cylinder actuator that will automatically close the valve. The cylinder actuator uses hydraulic water system pressure to supply the energy required to close the valve.
 - b. The existing HSP #1 is rated for 25 MGD at 185' TDH. The proposed replacement HSP #1 is rated for 15 MGD at 185' TDH, matching the head condition of the existing pump.
 - c. Results from the City's hydraulic model were used to develop system curves for max day and average day, which were used to confirm pump selection. The proposed HSP #1 will operate on a VFD which can be adjusted during operation to meet various duty points depending on demand.
4. LOX/LIN Storage
- a. Nitrogen usage is calculated based on 2.5 % of the oxygen usage:
- $$2,833 \text{ ppd O}_2 \times 0.025 = 71 \text{ ppd N}_2$$
5. Electrical Improvements
- a. The operation of the pumps is contained within a single switchgear at Pump Station No. 4. However, there will be a dual feed coming into the main plant switchgear that will supply redundant power to the plant, including Pump Station No. 4. There will also be two breakers

door
sweeps
not
fail
SAFE

would be
to
read
c62
& page

at the main plant switchgear that feed two different breakers at Pump Station No. 4.
Therefore, any one point of failure will not take the system down.

To
ODWMADEQ
RESOURCE MANAGEMENT DIVISION

APR 08 2014

LANSING DISTRICT

Proposed Bray Road Lime Sludge Management Plan**1. Introduction**

The City of Flint plans to utilize their existing WTP to provide water on a continuous basis. The city plans to treat water from the Flint River until construction of the proposed KWA supply system is complete and the WTP can then be used to treat water from Lake Huron. Until then, The City of Flint will be utilizing the Bray Road Disposal site to pump lime sludge for interim storage with decant water being pumped into the City of Flint sanitary sewer system. The Flint River and consequently the Bray Road facility will be utilized during the KWA Supply System era for emergencies or to supplement water supply demands beyond current max day provided by KWA.

2. Proposed Lime Sludge Management Plan

LAN has been working with the City to evaluate, design and implement a lime residuals disposal plan to handle softening sludge for the interim period and long term operation of using the Flint River as a water source. The most feasible option is the use of Bray Road lagoon which was constructed in 1958. The site has been used intermittently since then during select test runs by the City. However, a concern by the MDEQ about unauthorized discharges into the neighboring stream and disposal of street sweeping, concrete and asphalt chunks has made this site off limits for the time being. Our team is working with City staff to develop a preliminary work plan and schedule that will address the concerns of the MDEQ and allow the use of the site for continued discharges of lime sludge in the interim basis and in the long run when emergencies and supplemental water supply require the use of lime softening at the water treatment plant.

EXISTING SYSTEM

The most common sludge dewatering method is use of lagoons to settle the lime sludge and decant the water. The lime sludge from the water treatment clarifiers is transferred by pipe to a dewatering lagoon, e.g. at the Bray road site. The pipe network for the discharge line into the Bray Road site consists of an 8 " pipe with multiple discharge feeders with valves that distributes the flow of the lime sludge into the dewatering lagoon. This facility has one large dewatering lagoon and one small lagoon for decant water. The two are separated by a dike and a concrete structure with an adjustable stop log system that controls the flows between the two lagoons. The large dewatering lagoon is capable of decanting the water on top of the sludge (supernatant) to the adjacent small lagoon for discharge to the nearby Cornwell Drain via an outlet tower. See Figure 1 - Existing Site Layout. Figure 2 – Decant Lagoon Blow Up.



The site was constructed in the late 1950s and was used on a permanent basis until the City entered into a contract to obtain treated water from the City of Detroit, at which time; the site was used occasionally for test runs as a redundant system. During this period, the City of Flint did not control fully site activities and some unauthorized discharges of illegal debris got placed within the site that has compromised the use of the site. As a result, The MDEQ has, on multiple occasions, requested that the City secure the site and insures that these activities are suspended while addressing the illegal disposal of street sweeping, concrete and asphalt debris within the site. See Figure 3.

PROPOSED SYSTEM

The proposed upgrades associated with the Softening Residuals Disposal have been categorized into Phase II – Segment II and are to be completed as soon as practical so that the WTP can be utilized to treat water from the Flint River in the spring of 2014. However, the use of the Bray Road lagoon for other disposal activities will require that this issue be addressed independently to certain extent as to isolate the problem areas while working with MDEQ to permit its use for lime sludge disposal.

In order to analyze the issues, define the possibility of using the site and address MDEQ concerns, the LAN Team has performed additional survey, geotechnical and environmental testing at the site in order to assess the condition of the lime sludge in the basin and to verify the capacity of the lagoon system. Based on the preliminary findings of this evaluation, proposed improvements will be designed to accommodate the use of the facility in the interim basis (during the use of the Flint river) while addressing some of the MDEQ concerns about the site and any unauthorized discharges into the nearby stream. Permitting for site use will be incorporated as part of the overall design improvements at the WTP and submitted to the MDEQ for their pre-permit review and comments. A final package will be submitted to the MDEQ at the 100% design stage for permit issuance and approval of work plan.

The intended Work plan encompasses the following action items:

1. Evaluate the existing conditions in comparison to the original site design and its intended functionality in order to evaluate required design changes. Figures 1 & 2 highlight the original design and select key elements while Figure 3 shows the changes that may affect proper operation of the system.
2. Site survey of the project site has been completed. Collected data confirms the plan that the site has the required capacity to handle the continuous full time operation of the plant during the next 30 to 36 months until the KWA system is constructed and connection is made at which time, lime softening will not be required, Figure 4 highlights the current



- site features and proposed elevation for the required volume and anticipated 2 feet free board.
3. In order to address MDEQ concerns about discharges to the Cornwell Drain, the outlet tower will be capped to terminate any discharges to the stream while lime softening is in use at the WTP.
 4. A separation barrier will be constructed to isolate the disposal area from the lime sludge discharge bay as shown in Figure 4.
 5. A decant structure and submersible pump station will be constructed in the SE corner of the upper lagoon bay to treat and dispose of flows into the City's sanitary system. This system will be fully operational while the plant is treating river water and lime softening is required. A new storm treatment outlet structure may be reestablished with the approval of MDEQ after the KWA connection is online and lime softening is no longer in use.
 6. In order to assess the potential impact of the disposal site on the ground water, two new monitoring wells were installed along the west side of the site in order to analyze the characteristics of the flow entering the site while using the existing monitoring wells to check whether these characteristics have worsened or not. Based on the results of the well data collected, it does not seem that the debris area is a cause for contamination to the site; However, The City will have to develop a more definitive environmental work plan to further evaluate and insure that the debris will not cause any detrimental effect on the groundwater system.

PROPOSED MANAGEMENT PLAN

Drying and selling lime sludge for agricultural lime is a desirable solution to the disposal problem, since the money made by the sale offsets the disposal cost paid by the water treatment plant: if the lime sludge were not sold as a product, no value for the material could be recovered. However, The City of Flint has not had the time to research this option and find a suitable consumer(s) for such a transaction. But this option will be pursued and the plan will be modified for approval by the MDEQ when such option becomes viable.

Lime sludge could be disposed of in municipal solid waste (MSW) landfills. However, it is safe to assume that MSW landfills would prefer stockpiled lime sludge to be somewhat dry, because landfills need to minimize the amount of leachate they generate. Furthermore, if lime sludge were sent to a MSW landfill, the producer of the sludge may have to pay for the costs of drying, loading, and transporting the sludge, plus tipping fees.

Since the sludge may need to be retained in the lagoon for an average 10 -12 months before it is excavated from the dewatering lagoon with a backhoe and isolated to be dried in the sun during the summer in a month or two depending on air temperature, sun exposure, and humidity. Therefore The City of Flint is proposing the following approach to their lime sludge management plan:



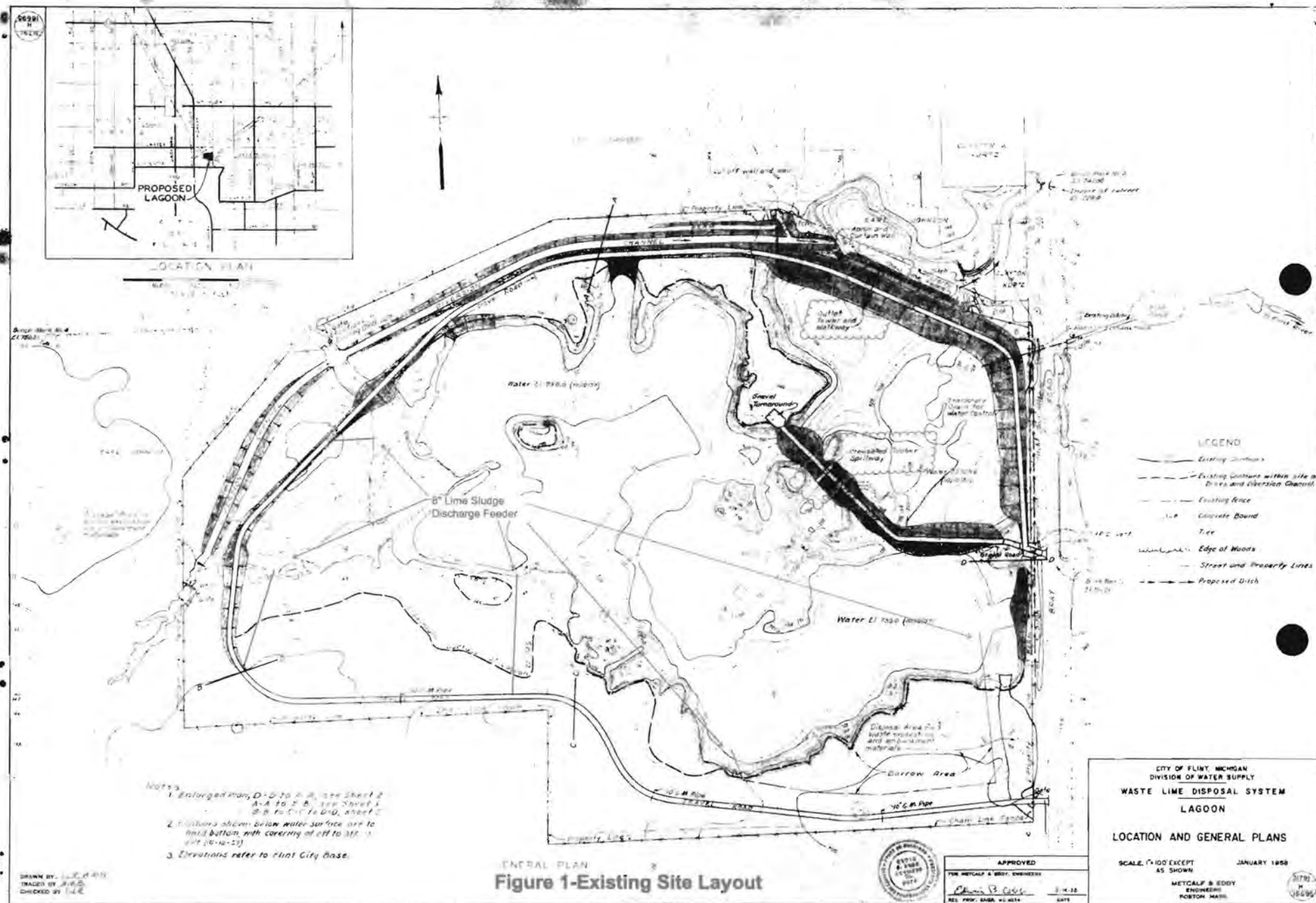
1. The City is committed to removing all new lime sludge to be generated during the operation of the plant using Flint River water in addition to 10% of the lime sludge already in place at the site.
2. The equivalent of 10% of existing lime sludge and all future accumulations will be disposed of site either at the landfill or using approved land application sites.
3. Existing lime sludge on site will be manipulated and stored in two semi isolated bays along the north side of the lagoon in order to allow the City to start removing it from site for disposal at the landfill until land application sites are determined and approved by MDEQ.
4. The four available orifices, on site, will be utilized to discharge lime sludge into the lagoon system based on a quarterly or semi-annual rotating schedule as to allow for proper distribution of the lime sludge within the lagoon.
5. No flows will be permitted into the decant lagoon until the pump station is fully operational. However, the plan is to maintain the level working surface within the sludge lagoon at 738.5' while the pump station and decant system is operational.

3. Implementation Schedule

The majority of the work associated with the operation of the WTP will need to be accomplished and completed by April 15, 2014 so the plant can be operational by April 17, 2014. All work associated with the Bray road site may not be complete but the following activities will be completed in order to allow for the successful operation of the Plant with MDEQ approval. The activities to be completed immediately are as follows:

1. Suitable Barrier of clay berm will be constructed to isolate the disposal area from the dewatering lagoon and will be completed as agreed to with MDEQ.
2. Outlet Tower will be bulk headed out of the decant lagoon as to insure no outflow to the stream nearby (Cornwell Drain).
3. New orifice will be installed near the SE corner of the site to replace the two damaged that will be abandoned.
4. Stop logs will be in place to isolate the dewatering lagoon from the decant lagoon until the pump station is operational.
5. Existing lime sludge will be manipulated along the edges as to excavate and store dry lime sludge in the upper two semi isolated bays for regular removal and disposal at the landfill until land application options are available for permitted use.

The City is committed to provide the appropriate improvements for the proper use of the site as a lime sludge disposal facility while addressing the issues associated with the unauthorized disposal areas so the site can be closed suitably and allow it to function as initially intended.



CITY OF FLINT, MICHIGAN
DIVISION OF WATER SUPPLY
WASTE LIQUOR DISPOSAL SYSTEM

LAGOON DIKE AND DIVERSION CHANNEL - I PLAN AND TYPICAL SECTIONS

SCALE: 1/4" = 1' EXCEPT
AS SHOWN

APPROVED

APPROVED

APPROVED

APPROVED

APPROVED

APPROVED

APPROVED

APPROVED

Figure 2 - Decant Lagoon Blow Up

RECEIVED BY THE DIRECTOR, NATIONAL ARCHIVES
ON 10/10/1963

**Figure 3**

© 2013 Google



Project No. 130-10701-001
Date: February 20, 2014

Prysby, Mike (DEQ)

From: Matta, Samir <SFMatta@lan-inc.com>
Sent: Wednesday, March 26, 2014 2:22 PM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ); Arduin, Jim (DEQ)
Cc: Daugherty Johnson; Brent Wright (bwright@cityofflint.com)
Subject: Bray Road Alternative Separation Concepts.
Attachments: Piling Concept 3-24-14 (2).pdf - Adobe Acrobat.pdf; MC-3500 Chamber from ADS StormTech System.pdf

Hi All,

As requested, the following two concepts are being discussed with the City and ultimately with the contractor to see which one is more in line with the project budget and can be accomplished in a timely matter. The attached concept shows sheet piling being proposed which will be terminated at the designated height needed to achieve a 2' freeboard along the alignment highlighted in RED.

The other concept which we discussed on the phone will entail using a light weight storm chamber (see attachment) fastened to a 4x8 plywood sheeting, attached together, with a geotextile fabric along the back side to follow the same alignment as the sheet piling option. It will be placed directly on the existing lime sludge in front of the disposal area for separation.

Please review, let me know if you have any questions and we can further discuss on Monday.

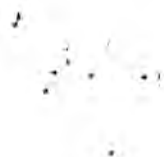
Thanks.

Samir F. Matta, PE
 Senior Project Manager



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**Flint WTP Improvements
Bray Road Lime Sludge Lagoon
MDEQ Comments
March 21, 2014**

1. The placement of the proposed liner and berm fails to establish physical separation between the lime sludge collection area and concrete fill area. For complete separation of these areas, the berm needs to be constructed down to native soil.

As proposed, this appears to constitute the first step towards a "cap-in-place" of the existing materials. If waste is left in place within the berm, the city will be required to construct the berm to meet Part 115 cap requirements. In addition, long term groundwater monitoring, financial assurance, closure and post closure plans will be required.

2. Please provide a residuals management plan for the lime sludge collection area. In addition to removal of new lime sludge produced, the plan must also include the gradual removal of existing lime sludge.
3. The working depth of the lime sludge collection area does not appear to meet 10-States Standard's minimum depth of 5 feet. The available volume appears to be 60,000 cubic yards based on 2.6 feet of working depth. Please confirm this. What is the surface area of the lagoon? Please provide a basis of design that includes the amount of lime sludge produced at average day demand and the available days of storage at this production rate. These parameters will need to be used towards developing the residuals management plan. Finally, an acceptable residuals management plan is needed for us to consider a deviation from the 10-State Standards guidelines.
4. An effluent sampling point needs to be provided for decant water.

— I really got plan
 — starting
 # shifts

— EOU on Non-Full Dec
 — was good - → dem. opt.
 — core. central

— Construct slh
 — Disposed opt

Total Hardness 272 mg/L use 300 mg/L as CaCO₃ 9/13/13 LAN Report
 Goal: 100 mg/L as CaCO₃
 200 mg/L removed
 10 states 7 Acre / 1 MGAL / 100 mg/L removed

5.20;

$$7 A \times 10 \text{ MGD} \times \frac{200 \text{ mg/L}}{100} \text{ removed} = 14 A$$

Based on 5 ft depth

We have 2.6 ft depth - 19 A

$$SA = 830,000 \text{ ft}^2 = 19 A$$

Rem 150 mg/L

$$7 A \times 10 \text{ MGD} \times \frac{150}{100} =$$

LAN Report

@ 14 MGD

$$@ 12\% \text{ sd. } \rightarrow 73,924 \text{ gpd} = 366 \text{ ft}^3/\text{day}$$

$$@ 25\% \rightarrow 183,400 \text{ ft}^3/\text{day}$$

$$25\% @ 10 \text{ mgd} \rightarrow 131 \text{ ft}^3/\text{day}$$

$$12 \text{ mgd} \rightarrow 157 \text{ ft}^3/\text{day}$$

$$\frac{60,000 \text{ yd}^3}{131 \text{ ft}^3/\text{day}} = 458 \text{ days} @ 10 \text{ mgd} \quad 1.25 \text{ yr}$$

$$382 \text{ days} @ 12 \text{ mgd} \quad 1.4 \text{ yr}$$

$$3 \text{ months} = 50,000 \text{ yd}^3 @ 10 \text{ mgd} \quad 3\%$$

$$455 \text{ yd}^3$$

$$@ 10 \text{ mgd} \quad \frac{60,000 \text{ yd}^3}{55 \text{ ft}^3/\text{day}} = 1091 \text{ days} \quad 3.2 \text{ yr}$$

$$@ 12 \text{ mgd} \quad \frac{60,000 \text{ yd}^3}{66 \text{ ft}^3/\text{day}} = 909 \text{ days} \quad 2.5 \text{ yr}$$

BASIS OF DESIGN

BRAY ROAD LIME SLUDGE DECANT WATER TREATMENT SYSTEM

CITY OF FLINT

1. GENERAL DATA

The City of Flint (City) proposes to use the existing lime sludge storage lagoon facility at Bray Road for the next 2.5 years on a continuous basis while the Karegnondi Water Authority (KWA) water system is being constructed. After which, the facility will only be used should the Flint WTP have to treat Flint River water on an emergency basis. In order to maximize storage volume of the facility, the City proposes to construct a decant tower structure, pump station and forcemain to transport the decanted water from the lagoon to a nearby sanitary sewer for final disposal. A CO₂ feed system is also proposed to neutralize the high pH decant waste stream prior to pumping to the sanitary sewer.

The existing lime sludge storage lagoon facility at Bray Road does not have multiple cells; therefore, the sludge will be continuously wetted and will only consolidate to approximately 25% solids. The lime sludge and decant waste stream flows are summarized in the table below:

Lime Sludge Quantities Summary

	WTP Flow [MGD]	Sludge Produced (3% Solids) [gpd]	Sludge Stored (25% Solids) [cy/day]	Decant Waste to Sewer [gpd]	Decant Waste to Sewer [gpm]
Average Day	10	92,000	55	80,700	56
Current Max Day	18	165,000	98	145,200	100
Prop. Max Day	24	220,000	131	193,600	135

2. CO₂ FEED SYSTEM

a. Process Description

A gaseous carbon dioxide feed system will be installed on the Bray Road site near the decant pump station. The system will include a liquid storage tank, vaporizer, vapor heater, pressure regulator, pH control panel and a gas diffuser. Liquid CO₂ will be stored in a 6-ton tank and regulated through a vaporizer. The gaseous CO₂ will be sent through diffuser piping and released into the decant tower through two (2) 7" diameter disk ceramic diffusers. A pH probe will be located in the decant tower to monitor pH downstream of the CO₂ injection point. The pH probe will transmit the pH reading to the pH control panel, which will regulate the CO₂ feed rate for set point control of the pH in the decant water waste stream.

b. Design Criteria

- Max CO₂ feed - 200 mg/L
- Max decant flow rate - 140 gpm

g

- CO₂ feed system capacity @ Max Day (140 gpm)

$$\frac{140 \text{ gpm}}{694.4 \frac{\text{gpm}}{\text{MGD}}} * 200 \text{ ppm CO}_2 * \frac{8.34 \text{ lb}}{\text{gal}} = 336 \text{ lb/day}$$

- CO₂ feed system capacity @ Average Day (60 gpm)

$$\frac{60 \text{ gpm}}{694.4 \frac{\text{gpm}}{\text{MGD}}} * 200 \text{ ppm CO}_2 * \frac{8.34 \text{ lb}}{\text{gal}} = 144 \text{ lb/day}$$

- CO₂ storage for minimum 30 days at Average Day per 10 States Standards

$$144 \frac{\text{lb}}{\text{day}} * 30 \text{ days} = 4,320 \text{ lbs} = 2.16 \text{ tons}$$

c. Equipment

- One (1) 6 ton capacity Liquid Carbon Dioxide storage tank system complete with refrigeration unit (6 ton is minimum for CO₂ delivery by tanker truck)
- One (1) 12 kW electric vaporizer
- One (1) vapor heater
- One (1) First stage CO₂ pressure regulator
- One (1) Carbon Dioxide pH control panel
- One (1) Carbon Dioxide gas diffuser assembly
- One (1) pH Transducer
- Two (2) 7" Diameter Ceramic Disk-type diffusers

3. DECANT TOWER

a. Process Description

The decant tower is a 6'x6' precast manhole with three (3) 12"W x 36"H staggered openings that will provide 9' of total operating depth for decanting. Each opening has an interior wall-mounted inverted slide gate with a manual operator and an external stoplog channel to allow maintenance on the slide gate when necessary. An under-flow baffle wall will be installed to promote CO₂ transfer into the decant waste stream and prevent short circuiting. A pH probe will be installed just below the invert of the 8" gravity pipe to the decant pump station.

b. Design Criteria

- Average day flow rate = 60 gpm
- Peak day flow rate = 140 gpm

- Minimum detention time = 20 min

$$\text{Min Detention Volume Required} = 20 \text{ min} * 140 \text{ gpm} * \frac{0.1337 \text{ ft}^3}{\text{gal}} = 374.3 \text{ ft}^3$$

- Minimum liquid level above diffuser = 10' per manufacturer

c. Equipment

- One (1) 6'x6'x25' precast manhole
 - Top of structure elevation = 744.00'
 - Top of baffle wall elevation = 742.00'
 - Maximum lagoon operating level elevation = 739.60'
 - Slide gate 1 invert elevation = 736.60'
 - Slide gate 2 invert elevation = 733.60'
 - Slide gate 3 invert elevation = 730.60'
 - 8" gravity line invert elevation = 730.33'
 - Lagoon bottom elevation = 730.00'
 - Bottom of baffle wall elevation = 722.00'
 - Diffuser centerline elevation = 720.25'
 - Bottom of decant tower elevation = 719.00'

- Detention Time:

$$\text{@ Max Day} \frac{[(730.33 - 719.00) * 6 * 7.48 \text{ gal}]}{140 \text{ gpm}} = 21.8 \text{ min}$$

$$\text{@ Average Day} \frac{[(730.33 - 719.00) * 6 * 7.48 \text{ gal}]}{60 \text{ gpm}} = 50.8 \text{ min}$$

- Minimum Operating Depth Over Diffusers: 730.33' - 720.25' = 10.08'
- Three (3) 12"W x 36"H inverted slide gates, 304SS
- Three (3) 20"W Stoplogs and channels, 304SS
- One (1) 6'W x 20'H Baffle Wall, FRP
- 8" Diameter Gravity line to Decant P.S., DIP or PVC

4. DECANT PUMP STATION DESIGN AND FORCEMAIN

a. Process Description

The decant pump station will be a 6' diameter precast concrete manhole. It will be fed through an 8" gravity line from the decant tower. Two (2) 140-gpm submersible solids handling pumps will be installed with quick discharge connections and guide rails for lifting and lowering the pumps for maintenance. The pumps will be controlled by a float switch assembly consisting of four (4) switches: pumps off; pump 1 on; pump 2 on; high water alarm. The pump

discharge piping will connect to a 4" diameter forcemain that will transport the waste stream to a nearby sanitary sewer.

b. Design Criteria

- Max Day flow rate, $Q_{max} = 140 \text{ gpm}$
- Average Day flow rate, $Q_{ave} = 60 \text{ gpm}$
- Maximum pump starts per hour = 10

$$\text{Cycle time } (\theta) = \frac{60 \text{ min}}{10 \text{ cycles}} = 6 \text{ min}$$

$$\text{Minimum sump volume} = \frac{Q_{pump} \cdot \theta}{4} = \frac{140 \cdot 6}{4} = 210 \text{ gal}$$

- Minimum forcemain velocity of 2 ft/s

c. Equipment

- One (1) 6' Diameter x 18'H precast manhole
 - Top of structure elevation = 744.00'
 - High Water Alarm elevation = 731.25'
 - Gravity line invert elevation = 730.25'
 - Pump 2 On elevation = 729.75'
 - Pump 1 On elevation = 728.75'
 - Pumps Off elevation = 727.50'
 - Bottom of pump station elevation = 726.00'

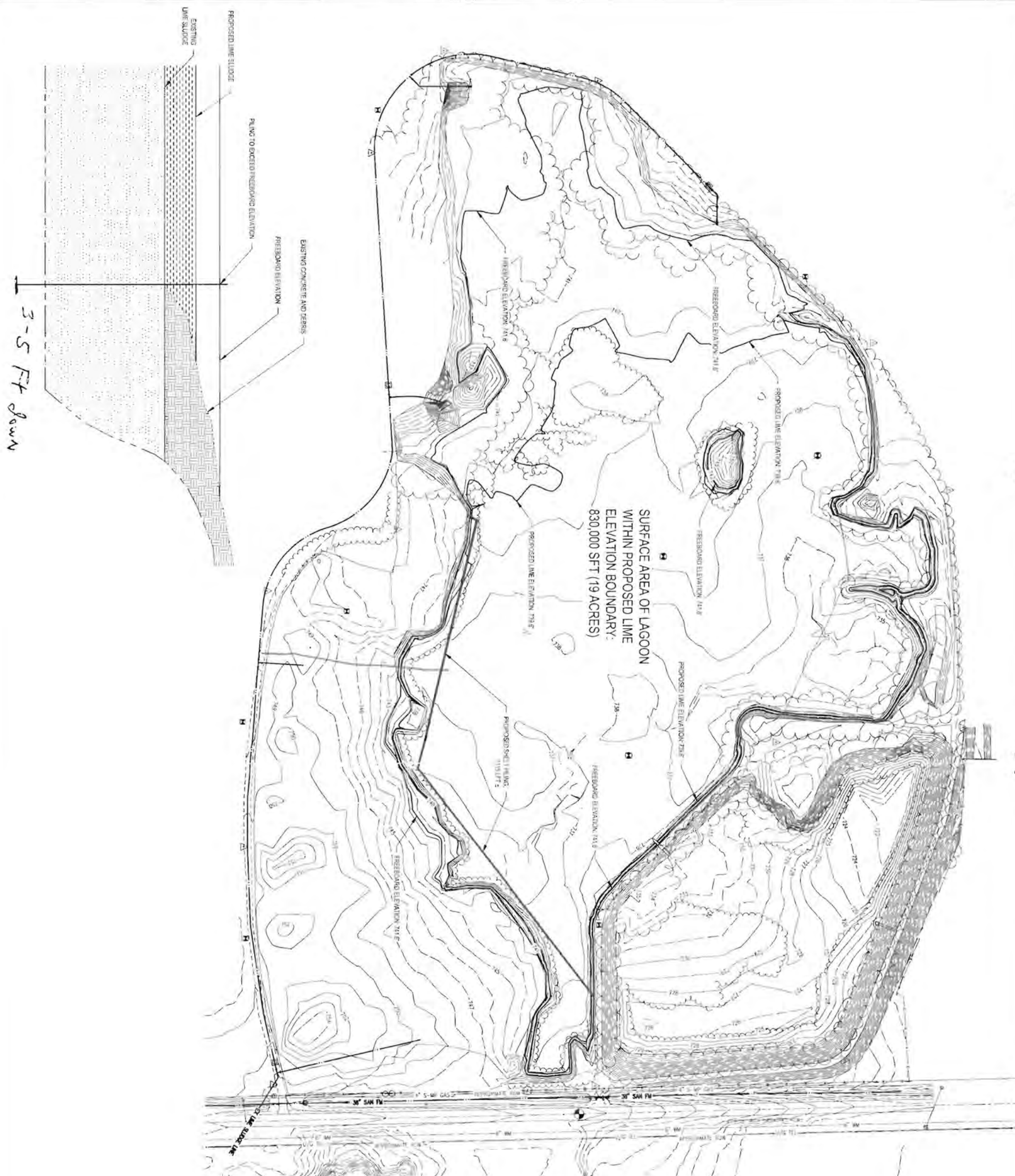
$$\text{Wetwell volume} = \frac{\pi D^2}{4} \cdot \frac{\pi 6^2}{4} = 28.27 \frac{\text{ft}^3}{\text{ft}} \cdot 7.48 \frac{\text{gal}}{\text{ft}^3} = 211.5 \frac{\text{gal}}{\text{ft}}$$

$$\text{Pump Run Time} = \frac{(728.75' - 727.50') \cdot 211.5 \frac{\text{gal}}{\text{ft}}}{(140 \text{ gpm} - 60 \text{ gpm})} = 3.3 \text{ min}$$

$$\text{Fill Time} = \frac{(728.75' - 727.50') \cdot 211.5 \frac{\text{gal}}{\text{ft}}}{(60 \text{ gpm})} = 4.4 \text{ min}$$

- Two (2) 140-gpm pumps
- One (1) 4-float switch assembly
- 4" Diameter Forcemain, DIP or PVC

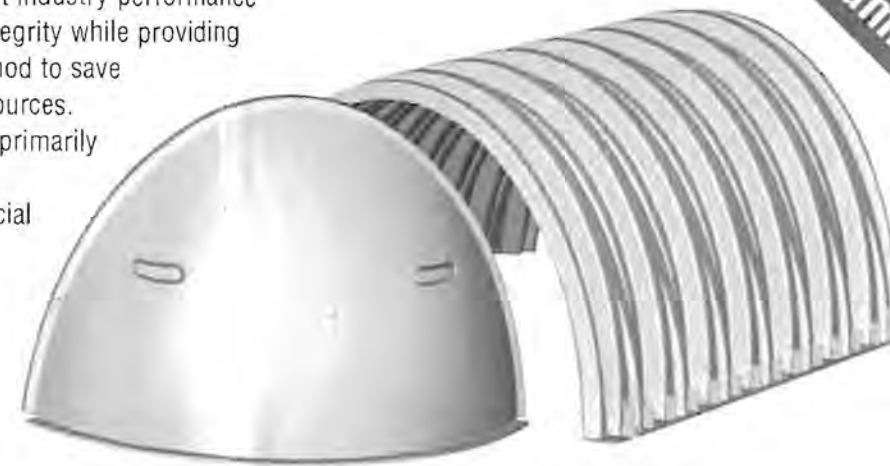
$$\text{Forcemain Velocity @ } Q_{max} = \frac{140 \frac{\text{gal}}{\text{min}} \cdot \frac{1 \text{ min}}{60 \text{ s}} \cdot \frac{1 \text{ CF}}{7.48 \text{ gal}}}{\pi \left(\frac{2}{12}\right)^2} = 3.6 \text{ fps}$$



THE UNIVERSITY OF CHICAGO

StormTech MC-3500 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots thus maximizing land usage for commercial and municipal applications.



MC-3500 Chamber

StormTech MC-3500 Chamber (not to scale)

Nominal Chamber Specifications

Size (L x W x H)	90" (2286 mm) x 77" (1956 mm) x 45" (1143 mm)
Chamber Storage	109.9 ft ³ (3.11 m ³)
Min. Installed Storage*	178.9 ft ³ (5.06 m ³)
Weight	134 lbs (60.8 kg)

* This assumes a minimum of 12" (305 mm) of stone above, 9" (229 mm) of stone below chambers, 9" (229 mm) of stone between chambers/end caps and 40% stone porosity.

StormTech MC-3500 End Cap (not to scale)

Nominal End Cap Specifications

Size (L x W x H)	26.5" (673 mm) x 71" (1803 mm) x 45.1" (1145 mm)
End Cap Storage	15.6 ft ³ (0.44 m ³)
Min. Installed Storage*	46.9 ft ³ (1.33 m ³)
Weight	43 lbs (19.5 kg)

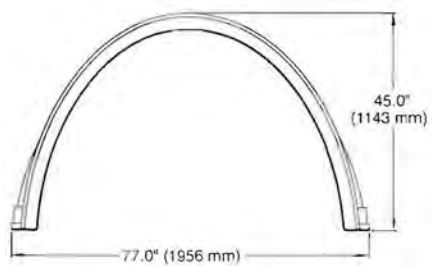
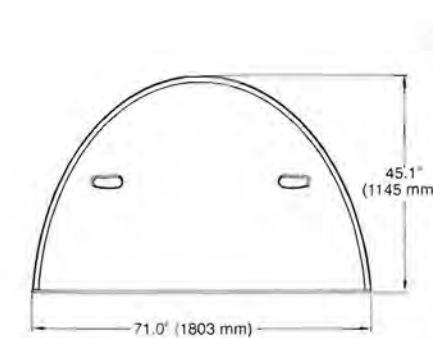
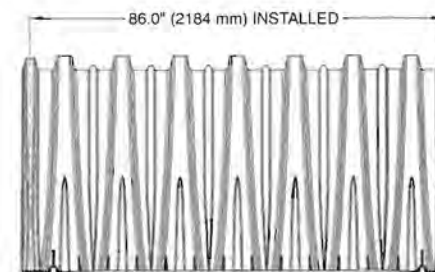
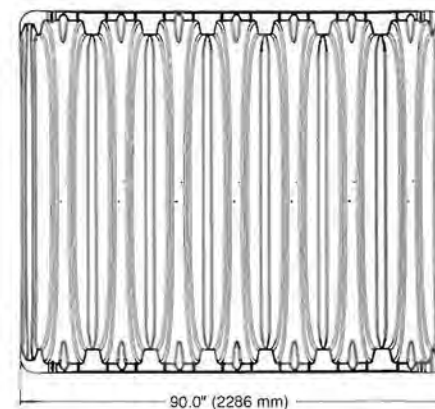
* This assumes a minimum of 12" (305 mm) of stone above, 9" (229 mm) of stone below, 6" (152 mm) of stone perimeter, 9" (229 mm) of stone between chambers/end caps and 40% stone porosity.

Shipping

15 chambers/pallet

16 end caps/pallet

7 pallets/truck



PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS
 (CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Environmental Quality (DEQ) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint 4500 North Dort Highway Flint, MI 48505 WSSN: 02310	Permit Stamp Area (DEQ use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 140025 APR 09 2014 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976	
2. Owner's Contact Person (provide name for questions): Contact: Brent Wright Title: Plant Supervisor Phone: 810-787-6537		
3. Project Name (Provide phase number if project is segmented): 1) Flint WTP Phase II, Segment I - Initial Watermain Cut-In / Rehabilitation; 2) Flint WTP Phase II, Segment II - Lime Residual Disposal; 3) Flint WTP Phase II, Segment III - Electrical Improvements	4. Project Location (City, Village, Township): City of Flint	5. County (location of project): Genesee County

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY

CC:

Issued by: Reviewed by: 
for Mike Prusky
☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DEQ District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions will be returned. SEE EXAMPLES BELOW. Use additional sheets if needed.

Improvements to the City of Flint WTP to enable treatment of Flint River water on an interim basis until the KWA Lake Huron Water Supply is available for connection and use by the City of Flint:

PHASE II, SEGMENT I - INITIAL WATERMAIN CUT-IN / REHABILITATION (@WTP):

- * Replace existing 25 MGD HSP #1 at Pump Station No. 4 with a new 700 HP, vertically mounted, split-case centrifugal pump rated for 15 MGD at 185' TDH. New pump suction and discharge piping, valves and supports will also be provided.
- * Construction of new ozone system LOX/LIN storage facility to provide system redundancy and a minimum of 30 days chemical storage. A new concrete containment structure will be constructed adjacent to the existing LOX/LIN storage facility. The new LOX and LIN tanks will have nominal capacities of 9000 gal. and 525 gal., respectively.
- * Installation of Midpoint Chlorination. A 3"x6" dual walled chlorine solution line, approx. 665 LF, will be installed from the existing chlorine room at Pump Station No. 4 to a diffuser in the filter influent channel at Plant 2. The chlorine gas feed system shall consist of four 500 ppd feed systems (total 2000 ppd) to be installed by City personnel. Each 500 ppd system consists of a ton cylinder mounted vacuum regulator, control panel, ejector, and misc. piping, tubing & valves.
- * Approx. 850 LF 42" raw watermain connection from existing 48" and 36" mains that feed the plant to convey KWA raw water to the Ozone Building. Work includes a 54x48 cross to make the initial connection at the Ozone Building, buried yard butterfly valves, access and air release manholes, and cathodic protection test stations.

PHASE II, SEGMENT III - ELECTRICAL IMPROVEMENTS (@WTP):

- * Plant substation improvements, including two new 2500 kW transformers and switchgear. The substation switchgear has been fabricated with two utility main breakers, one generator breaker and two tie breakers. So provisions are in place for a future permanent generator. If a temporary generator is needed in the event of an outage to both independent utility services, provisions are in place to temporary cable a large portable generator through a manhole, duct bank and cable tray system to the generator breaker in the substation switchgear.
- * Plant 2 electrical improvements, including two new 500 kW transformers and switchgear.
- * Pump Station No. 4 improvements, including new switchgear and VFD for HSP #1.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address:

Jeremy N. Nakashima, PE
Lockwood, Andrews & Newnam, Inc.
1 Oakbrook Terrace, Suite 207
Oakbrook Terrace, IL 60181
630-495-4123 / jnnakashima@lan-inc.com

8. Indicate who will provide project construction inspection:

- ☒ Organization listed in Box 1.
☒ Engineering firm listed in Box 7.
☐ Other - name, address, and phone number listed below.

9. Is a basis of design attached?

☒ YES ☐ NO

If no, briefly explain why a basis of design is not needed. Submitted previously under separate cover.

10. Are sealed and signed engineering plans attached?

☒ YES ☐ NO

If no, briefly explain why engineering plans are not needed. Plans and specs submitted previously under separate cover.

11. Are sealed and signed construction specifications attached?

☒ YES ☐ NO

If specifications are not attached, they need to be on file at DEQ.

12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed?

☒ YES ☐ NO

If no, explain which deviations were made and why.

13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved?

☒ YES ☐ NO

If no, describe what coatings, additives or materials did not meet the applicable standard and why.

14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement?

(For projects not located in the public right-of-way, utility easements must be shown on the plans.)

☐ YES ☒ NO

If no, explain how access will be obtained. Most work will be on City owned property, except forcemain.

15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451?

☐ YES ☒ NO

If yes, a wetland permit must be obtained.

16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules?

☐ YES ☒ NO

If yes, a flood plain permit must be obtained.

17. Is the project construction activity within 500 feet of a lake, reservoir, or stream?

☒ YES ☐ NO

If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?

☐ YES ☒ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☐ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES ☒ NO

If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) _____

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☐ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DEQ.

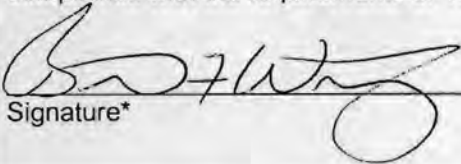
21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, BRENT F. WRIGHT (name), acting as the WATER PLANT SUPERVISOR (title/position) for
(print) (print)

CITY OF FLINT (entity owning proposed facilities) certify that this project has
(print)

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.


Signature*

3-31-2014
Date

(810) 787-6537
Phone

*Original signature only, no photocopies will be accepted.

Permit Application for Water Systems (Continued)

PROJECT BASIS OF DESIGN – FOR WATER MAIN PROJECTS

PROJECT NAME: _____

For this PROJECT the following information must be provided per Act 399 unless waived by the Department. For projects other than water main installation, or if additional space is needed, attach separate sheet(s) with detailed Basis of Design calculations.

- A. A general map of the initial and ultimate service areas
☐ Included on engineering plans ☐ Attached separately
- B. Number of service connections served by this permit application _____
- C. Total number of service connections ultimately served by entire project _____
- D. Residential Equivalent Units (REUs) served by this permit application _____
- E. Total Residential Equivalent Units (REUs) ultimately served by entire project _____
- F. Water flow rates for proposed project based on REUs listed in "D" and "E" above
1. Initial design average day flow (mgd) _____
 2. Initial design maximum day flow (mgd) _____
 3. Total design average day flow (mgd) _____
 4. Total design maximum day flow (mgd) _____
 5. Required fire flows: ⁽¹⁾ _____ gpm for _____ hours
- G. Actual flows and pressures of existing system at the connection point(s) ⁽²⁾
- _____ gpm at _____ psi
 _____ gpm at _____ psi
 _____ gpm at _____ psi
 _____ gpm at _____ psi
- H. Estimated minimum flows and pressures within the proposed water main system ⁽³⁾
- _____ gpm at _____ psi

(1) Every water system must decide what levels of fire fighting flows they wish to provide. Fire flow should be appropriate for the area (residential, commercial, industrial) being served by the project. Typical fire flow rates can be obtained from the water supply, local fire dept., ISO or AWWA. The water system must then be designed to be able to provide the required fire flows while maintaining at least 20 psi in all portions of the distribution system.

(2) Flows and pressures at the connection points must be given to determine if the existing water main(s) are able to deliver water to the new service area. These numbers can be obtained from a properly modeled and calibrated distribution system hydraulic analysis or hydrant flow tests performed in the field. If more than one connection is proposed, list as needed.

(3) List what the estimated minimum flows can be expected in the proposed water mains based on estimated water demands, head losses, elevation changes and other factors that may affect flows, such as dead end mains.



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

TRANSMITTAL

Filing Data Code 1-07

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To: Mr. Steve Busch, PE		Date 4-8-14	
Company: MDEQ		Project Number 130-10701-001	
Address: 525 WEST ALLEGAN STREET Lansing, MI 48933		Routing:	
Project: City of Flint Water Treatment Plant Improvements.			
We Are Sending You: ☐ Shop Drawings ☐ Original Drawings ☒ Prints ☐ Specifications ☐		These Are Transmitted: ☐ As Requested ☒ For Your Use ☒ For Review and Comment ☐ For Your Signature ☐	

Quantity	Description
2	22x34 Plans - Phase II, Segment 1 - Rehabilitation
2	22x34 Plans - Phase II, Segment 1 - Initial Watermain Cut-In
2	22x34 Plans - Phase II, Segment II - Lime Residual Disposal
2	Final Bray Road Lime sludge management Plan
1	Updated page 2 for permit applications
1	LAN Team Response to MDEQ Review comments

Remarks

These plans are being submitted for permit issuance as discussed.

DEC
RESOURCE MANAGEMENT DIVISION
APR 08 2014
LANSING DISTRICT

Distribution

- 1- Daugherty Johnson
- 2- Brent Wright
- 3- File

Prepared By

Samir Matta, PE

1311 SOUTH LINDEN ROAD
SUITE B
FLINT, MI 48532

TEL 810.820.2682

FAX 810.820.2703

www.lan-inc.com

**Flint WTP Improvements – Phase II, Segments I, II, and III
Responses to MDEQ Review Comments dated 4-3-2014**

The MDEQ review comments dated 4-3-14 have been addressed as noted in the responses below. Revised drawings have also been prepared in conjunction with these responses and have been included in the attached revised drawing sets for Phase II, Segments I, II, and III.

DEQ
RESOURCES MANAGEMENT DIVISION

APR 08 2014

LANSING DISTRICT

Phase II – Segment 1 - Watermain Cut-in Plans

- **Mid-Pt Chlorination - update plans to depict the additional anti-siphon/ball valve as described in your response to our March 19, 2014 comments. Most likely to be added to Sheet C-508.**

Response: The anti-siphon/ball valve is shown on revised Sheet C-104, dated 4-7-14.

- **Include a full-sized mid-point chlorination system schematic with the updated plans.**

Response: The mid-point chlorination system schematic has been included in the Phase II, Segment I – Initial Watermain Cut-in drawings as Sheet C-509, dated 4-7-14.

- **It appears that make-up water and chlorine gas are not combined at the chlorine feeder (panel w. rotometer, vacc. monitor, auto. feed control valve, etc.) for production of liquid chlorine. Instead, this appears to take place at the ejector/check valve assembly on the plant supply line. Please confirm. If gas under vacuum is conveyed to the ejector at the plant supply line, the gas piping must be Schedule 80 seamless steel tubing. Please confirm. This can be included on the chlorination system schematic.**

Response: The above description of the midpoint chlorination system is essentially correct. As shown on Sheet C-509, the mid-point chlorination system is a vacuum system. The vacuum regulators are mounted directly to the chlorine storage cylinders. Vacuum lines run from the regulators to the chlorinator control panels where feed rate is controlled. Vacuum lines are then connected from the control panel to ejectors, where water supply flowing through the ejectors creates the vacuum required to pull gas from the storage tanks. While the ejectors are not located in the control panel, it is common to have the ejectors remotely mounted from the control panels. A review of the 10 State Standards requirement for Schedule 80 seamless steel tubing appears to be for pressure gas feed systems, and not vacuum gas feed systems as proposed for Flint. As such, the recommended vacuum line material for a 500

ppd system is 5/8" O.D. flexible polyethylene plastic tubing (see attached information from Hydro Instruments).

Please provide 2 full-sized sets of Watermain Cut-in Plans that include the requested information and revisions.

Phase II - Segment 1 - WTP Rehabilitation Plans

- **LOX/LN Storage & Piping – update plans to depict revised sheets D2-102 and D2-601. The revisions were made to clarify the gas piping configuration.**

Response: Revised drawings D2-101, D2-102, D2-301, D2-502, and D2-601 have been included in the updated plan set.

- **The existing LOX storage tank will provide approximately 16 days storage at max design rate at 12.0 MGD until the second tank is installed. The Act 399 permit will be issued with a condition that the MDEQ is provided a copy of the contract between the city and the LOX supplier that specifies the maximum delivery time. The LOX system shall be operated such that a minimum of 5 days storage is maintained in the LOX tank at all times.**

Response: The City will provide MDEQ a copy of the contract between the City and their LOX supplier under separate cover. LOX can be supplied within 24 hours of when a purchase order is issued.

- **Mid – Point Chlorination (Chlorine room) - revise sheets C5-105 and C5-508 to show deletion of the chlorine gas scrubber system.**

Response: Sheets C5-105, C5-508, and EP6-101, which are all specific to the chlorine scrubber work only, have been deleted in their entirety from the updated plan set.

- **Revise the ventilation intake duct detail (Sheet C5-508) to as described in your response.**

Response: This intake duct detail is no longer applicable as it is for the chlorine scrubber system, which has been deleted. As noted in the previous MDEQ review comment responses, the City will extend the existing ventilation intake ductwork in the existing Chlorine Storage Room to finished floor level. This work has been added to the Phase II, Segment I – Initial Watermain Cut-in plan set, see Note 7 of revised drawing Sheet C-103.

- **Add panic hardware to chlorinator room door (east and west exits).**

Response: The City will perform this work. This work has been added to the Phase II, Segment I – Initial Watermain Cut-in plan set, see Note 8 of revised drawing Sheet C-103.

- **The existing door between P.S. 4 and the chlorine gas storage room should be closed off such that the chlorine gas storage room and chlorinator room are only assessable from the outside. Although an improved door sweep is proposed, door sweeps are not failsafe in a catastrophic gas release and such an event could jeopardize the entire P.S. #4.**

Response: The City will perform this work. This work has been added to the Phase II, Segment I – Initial Watermain Cut-in plan set, see notes on revised drawing Sheet C-103.

- **Raw Water Piping – the proposed 54X42 cross provides minimal vertical separation (approximately 6-inches). A pair concrete cradles installed on each side of the 54-inch concrete main will mitigate the force of the 42-inch main installed above at the crossing. A condition will be added to the Act 399 permit to field adjust the 42-inch main installation to maximize the vertical separation at the crossing.**

Response: The Contractor is required to field verify the elevation of the existing 54" pipeline. The City or the City's representative onsite observing construction will coordinate with the Contractor to ensure that the clearance between the 42" and 54" pipelines is increased to the maximum extent practical.

Please provide 2 full-sized sets of WTP Rehabilitation Plans that include the requested information and revisions.

Phase II – Segment 2 - Bray Road Sludge Lagoon

Provide 2 full-sized sets of construction plans for proposed work at the Bray Road sludge lagoon. Separation between the concrete disposal area the lime sludge disposal area by metal sheet piling, as discussed in our meeting, needs to be depicted.

Response: 2 full sized sets of construction plans of proposed work at the Bray Road Sludge Lagoon are included for your review and file. The separation barrier between the concrete disposal area and the lime sludge disposal area will be accomplished by

establishing a clay barrier that extends to the bottom of the original lagoon bottom as shown in the detail on sheet C-501. The separation barrier will be constructed within the lime sludge lagoon away from the concrete disposal area as to provide complete separation as discussed.

Prepare final Bray Road Lime Sludge Management Plan. The plan also needs to include establishment of a level working surface in the west portion of the lagoon and removal of the island.

Response: A final version of the Bray Road Lime Sludge Management Plan is being included with this final submittal. A level working surface of 738.5' has been designated within the sludge lagoon after the pump station is operational. All debris or vegetation growth within the 742' elevation within the sludge lagoon is intended to be removed and cleared by the contractor.

The Act 399 permit will also include a condition requiring the sheet piling to be driven deep enough into native soil to maintain its structural integrity for removal of waste material on the exterior portion of the lagoon.

Response: Sheet piling is no longer being used as the separation barrier based on further discussion with the contractor and availability. A clay berm will be constructed for the full depth within the lime sludge lagoon using the original bottom of the sludge lagoon as a base using the proposed alignment proposed for the sheet piling.

Act 399 Permit Applications:

WTP Rehabilitation:

Part 6 (Facilities Description) needs to discuss the provisions for the stand-by generator. The description needs to be added in the Phase II – Segment III – Electrical Improvements (@WTP) – (i.e. transfer switch, universal generator connection)

Response: See attached revised Part 6 of the Act 399 Permit Application forms.

Bray Road (Flint WTP Phase II, Segment II – Lime Residual Disposal)

Please revise Part 6 (Facilities Description) since a berm-liner system will not be used to separate the lime sludge area from the concrete debris area. Eliminate "Berm/liner" from the statement: "Berm/liner or Sheet Piling improvements to separate concrete debris from lime sludge."

Response: See attached revised Part 6 of the Act 399 Permit Application forms.

MDEQ
Comments
& LAN's
Responses

Flint WTP Improvements
Phase II
Segments I-III
MDEQ Comments
April 3, 2014

Phase II – Segment 1 - Watermain Cut-in Plans

- Mid-Pt Chlorination - update plans to depict the additional anti-siphon/ball valve as described in your response to our March 19, 2014 comments. Most likely to be added to Sheet C-508.
- Include a full-sized mid-point chlorination system schematic with the updated plans.
- It appears that make-up water and chlorine gas are not combined at the chlorine feeder (panel w. rotometer, vacc. monitor, auto. feed control valve, etc.) for production of liquid chlorine. Instead, this appears to take place at the ejector/check valve assembly on the plant supply line. Please confirm. If gas under vacuum is conveyed to the ejector at the plant supply line, the gas piping must be Schedule 80 seamless steel tubing. Please confirm. This can be included on the chlorination system schematic.

Please provide 2 full-sized sets of Watermain Cut-in Plans that include the requested information and revisions.

Phase II - Segment 1 - WTP Rehabilitation Plans

- LOX/LN Storage & Piping – update plans to depict revised sheets D2-102 and D2-601. The revisions were made to clarify the gas piping configuration.
- The existing LOX storage tank will provide approximately 16 days storage at max design rate at 12.0 MGD until the second tank is installed. The Act 399 permit will be issued with a condition that the MDEQ is provided a copy of the contract between the city and the LOX supplier that specifies the maximum delivery time. The LOX system shall be operated such that a minimum of 5 days

Act 399 Permit Applications:**WTP Rehabilitation:**

Part 6 (Facilities Description) needs to discuss the provisions for the stand-by generator. The description needs to be added in the Phase II – Segment III – Electrical Improvements (@WTP) – (i.e. transfer switch, universal generator connection)

Bray Road (Flint WTP Phase II, Segment II – Lime Residual Disposal)

Please revise Part 6 (Facilities Description) since a berm-liner system will not be used to separate the lime sludge area from the concrete debris area. Eliminate “Berm/liner” from the statement: “Berm/liner or Sheet Piling improvements to separate concrete debris from lime sludge.”

storage is maintained in the LOX tank at all times.

- Mid – Point Chlorination (Chlorine room) - revise sheets C5-105 and C5-508 to show deletion of the chlorine gas scrubber system.
- Revise the ventilation intake duct detail (Sheet C5-508) to as described in your response.
- Add panic hardware to chlorinator room door (east and west exits).
- The existing door between P.S. 4 and the chlorine gas storage room should be closed off such that the chlorine gas storage room and chlorinator room are only assessable from the outside. Although an improved door sweep is proposed, door sweeps are not failsafe in a catastrophic gas release and such an event could jeopardize the entire P.S. #4.
- Raw Water Piping – the proposed 54X42 cross provides minimal vertical separation (approximately 6-inches). A pair concrete cradles installed on each side of the 54-inch concrete main will mitigate the force of the 42-inch main installed above at the crossing. A condition will be added to the Act 399 permit to field adjust the 42-inch main installation to maximize the vertical separation at the crossing.

Please provide 2 full-sized sets of WTP Rehabilitation Plans that include the requested information and revisions.

Phase II – Segment 2 - Bray Road Sludge Lagoon

Provide 2 full-sized sets of construction plans for proposed work at the Bray Road sludge lagoon. Separation between the concrete disposal area the lime sludge disposal area by metal sheet piling, as discussed in our meeting, needs to be depicted.

Prepare final Bray Road Lime Sludge Management Plan. The plan also needs to include establishment of a level working surface in the west portion of the lagoon and removal of the island.

The Act 399 permit will also include a condition requiring the sheet piling to be driven deep enough into native soil to maintain its structural integrity for removal of waste material on the exterior portion of the lagoon.

**Flint WTP Improvements
Phase II
Segments I-III
MDEQ Comments
March 19 , 2014**

Segment 1 - Cut -in Piping

The detail shows air-release manholes with corp. stops? How will the air release operation be executed? Means to drain the manhole?

Written response needed.....

Segment 1 – WTP Rehab

1. Raw Water Piping – Maintain back-up supply from Gen Co. during interim operation at C.S. #2. Sheet C5-102

54X42 cross (Sheet C5-501 & C5-101) only 6-inches – Support?

Air-release manhole – same as Cut-in piping

Current yard piping diagram?

Written response needed on the first 3 items. Yard piping diagram will be a work in progress.

2. Mid-Point CL2 - Basis of design provided

- Scale – use existing or proposed? If proposed - type, capacity
- Scrubber?
- Room air-exchange rate ?
- Pipe penetrations – discuss protective seal
- Floor drains – discuss
- Door sweep - discuss
- Scrubber piping – lower intake

See 516 2700

- Check valve/anti-siphon at influent channel - include in final

3. High Service Pump

Will mechanical ball valve operate like a check valve in event of unexpected pump shut-down?

TDH of current pump and proposed pump?

Conformance of proposed pump TDH with system head curve?

Written response needed.....

4. LOX/LN Storage

Piping configuration clarified

The LN calculation (71 ppd) is not clear. Is there a % concentration or transfer efficiency?

5. Electrical improvements

Are operation of the pumps being split with the MCC or are multiple MCCs being provided?

Written response needed.....

**Flint WTP Improvements
Phase II
Segments I-III
MDEQ Comments
February 27, 2014**

*2 FKNs
- ACCESS
- MONITOR a.R. 1.11C
to connect to WTP
to release air
to day filling*

Segment 1 - Cut-in Piping

- ✓ The detail shows air-release manholes with corp. stops? How will the air release operation be executed? Means to drain the manhole?

Segment 1 - WTP Rehab

→ Pump can down

- ✓ 1. Raw Water Piping - Maintain back-up supply from Gen Co. during interim operation at C.S. #2. Sheet C5-102

- ✓ 54X42 cross (Sheet C5-501 & C5-101) only 6-inches - Support?

- ✓ Air-release manhole - same as Cut-in piping

Current yard piping diagram?

2. Mid-Point CL2 - Basis of design needed

- Application rate (both mid-pt & post for CT)
- CL2 gas max dosage LBS/Day
- Scale - type, capacity ✓ *new calculation IND*
- Rotometer (lbs/day)
- Vacc reg, injector, educator (size)
- Scrubber capacity - *not being installed*
- Room air-exchange rate *1/3.3 MIN*
- Pipe penetrations - Sheet C-103 - linkseal - gas resistant? *- will inspect & seal*
- Floor drains *- to be rigged?*
- Door sweep - *new better sealing sweeps to be provided?*
- Safety features - obs window, fan, lights, switches, panic bar
- Scrubber piping - lower intake *→ will extend to floor in 20' bend*
- Check valve/anti-siphon at influent channel - *yes*

hydraulic network
will close on system
failure / split - down

3. High Service Pump

Will mechanical ball valve operate like a check valve in event of unexpected pump shut-down?

185
TDH of current pump and proposed pump?

Conformance of proposed pump TDH with system head curve?

will match w. smaller pump

4. LOX/LN Storage

LOX & LN piping clarification – Sheet D2-102 & D2-601

BOD for storage

Ozone was designed at 4.0 mg/l max dose @ 36 MGD (Sec. 3.5 WTP BOD)

Ozone max dose at 18.0 MGD is 650 Lbs/day

How many GPD does this equate to?

5. Electrical improvements

Are operation of the pumps being split with the MCC or are multiple MCCs being provided?

one switchgear - dual feed
Two breakers - K & L bay

Flint WTP Improvements – Phase II, Segments I, II and III

Responses to MDEQ Review Comments dated 3/19/2014

Segment I – Initial Watermain Cut-in

- ✓ 1. Detail 2, Sheet C-504, "Air Release & Access Manhole," shows a 2" corp stop for air release. These are intended to be manual air release valves for exhausting air upon initial filling of the pipeline or after maintenance has been performed and refilling the pipeline. The manhole structure will be checked periodically and pumped out with a portable sump pump as part of the normal plant maintenance program.

Segment I – Rehabilitation

1. Raw Water Piping

- ✓ a. Maintain back up supply from Genesee County during interim operation at C.S. #2. Installation of the 42" raw water piping has been delayed until the KWA project is closer to being ready to supply water to the City. This will allow the City to maintain the backup supply from Genesee County during interim operation.
- b. The crossing of the new 42" steel pipe over the existing 54" concrete pipe is shown in plan on drawing sheet C5-101, with Detail 5, Sheet C5-501 showing how the 42-inch line will be supported. As shown on Detail 5, Sheet C5-501, the new 42-inch line will have concrete pipe cradles constructed on either side of the existing 54" pipe, maintaining a minimum clearance of 12" on either side of the 54" pipe. Pipe loads from the 42" line will then be transferred to the pipe cradles and into the soil, and not the 54" pipe. The 6" clearance between the two pipes will be backfilled with CLSM material as it will be impossible to compact typical granular bedding material under the 42" pipe.
- c. Detail 2, Sheet C5-505, "Air Release & Access Manhole," shows a 2" corp stop for air release. These are intended to be manual air release valves for exhausting air upon initial filling of the pipeline or after maintenance has been performed and refilling the pipeline. The manhole structure will be checked periodically and pumped out with a portable sump pump as part of the normal plant maintenance program.
- d. See attached color coded yard piping diagram.

2. Midpoint Chlorination

- a. Four (4) new scales will be provided for monitoring chlorine usage from ton containers. Scales shall be as manufactured by Scaletron Industries Ltd. with a load range of 0 to 4000 lbs.
- b. The City has not been able to determine that the chlorine scrubber is a requirement of any applicable code. At this time, the City will not be installing the chlorine scrubber shown on the design drawings and will rely on the existing ventilation system to exhaust air from the Chlorine Storage Room.
- c. The existing ventilation in the Chlorine Storage Room was tested to have a capacity of 18.3 air changes per hour, or 0.305 air changes per minute. Therefore, one room volume air

change would take approximately 3.3 minutes with the current ventilation system. See attached test results. Due to the size of the existing Chlorine Storage Room, a ventilation system of 1 air change per minute is not practical. While the existing ventilation system capacity is less than 1 air change per minute, it appears to be in compliance with 10 State Standards as lesser rates may be considered in cases where 1 air change per minute is not appropriate due to the size of the room.

- d. WTP staff will identify and inspect all proposed and existing piping and conduit wall penetrations in the Chlorine Storage Room and seal as necessary to prevent gas leakage into other parts of Pump Station No. 4.
- e. Existing floor drains in the Chlorine Storage Room were for condensate from the old chlorine evaporator system. These drains will no longer be used and will be plugged by WTP staff.
- f. WTP staff will attach new door sweeps with better seals at existing doors as required.
- g. WTP staff will extend existing ventilation intake ductwork to finished floor level with 90-degree bends.
- h. Per Addendum No. 1, an Anti-siphon / Back Pressure Valve and additional ball valve shall be added just prior to the trough wall penetration. The anti-siphon / back pressure valve shall be PVC and designed for use with chlorine systems. The valve shall be a LMI #35856, Walchem E90422, or engineer approved equivalent. The valve shall be installed between the two ball valves to allow for isolation during servicing. The valve shall be located above the high water level in the trough. The Contractor shall install a 1" drain line from the relief port to the finished floor elevation of the pipe gallery.

*Door
sweeps
not
fail
SAFE*

*Window
to
Read
Cl₂
usage*

3. High Service Pump

- a. The new 16" pump control ball valve for HSP #1 replaces the existing pump control ball valve in kind and will operate in the same manner as the existing valve. The valve will act like a check valve upon emergency shutdown of the pump through the use of a hydraulic cylinder actuator that will automatically close the valve. The cylinder actuator uses hydraulic water system pressure to supply the energy required to close the valve.
- b. The existing HSP #1 is rated for 25 MGD at 185' TDH. The proposed replacement HSP #1 is rated for 15 MGD at 185' TDH, matching the head condition of the existing pump.
- c. Results from the City's hydraulic model were used to develop system curves for max day and average day, which were used to confirm pump selection. The proposed HSP #1 will operate on a VFD which can be adjusted during operation to meet various duty points depending on demand.

4. LOX/LIN Storage

- a. Nitrogen usage is calculated based on 2.5 % of the oxygen usage:

$$2,833 \text{ ppd O}_2 \times 0.025 = 71 \text{ ppd N}_2$$

5. Electrical Improvements

- a. The operation of the pumps is contained within a single switchgear at Pump Station No. 4. However, there will be a dual feed coming into the main plant switchgear that will supply redundant power to the plant, including Pump Station No. 4. There will also be two breakers

at the main plant switchgear that feed two different breakers at Pump Station No. 4. Therefore, any one point of failure will not take the system down.



Proposed Scope of Upgrades to Flint WTP

Phase II - Segments I & II

1. Introduction

The City of Flint plans to utilize their existing WTP to provide water on a continuous basis. The city plans to treat water from the Flint River until construction of the proposed KWA supply is complete and the WTP can then be used to treat water from Lake Huron. The following proposed improvements are needed to place the WTP into service next spring. These improvements will remain in service once the KWA is in service.

2. Scope of Work

The proposed upgrades have been categorized into Phase II – Segment I and are to be completed as soon as practical so that the WTP can be utilized to treat water from the river in the spring of 2014. Engineering services will include final design, plans, contract documents, bidding assistance. Since time is of importance, specifications and schematic drawings will also be provided for pre-procurement of long lead item equipment and are outlined within each section below. Contract administration and construction phase services are not included within the initial scope of services.

- Design Progress Meetings: Meet with City staff to provide project status updates and to discuss specific design issues and details in order to facilitate timely design decisions. Meetings will include design team personnel from each discipline as required, City operations staff and administrative staff. Five (5) design progress meetings are included.
- Prepare and update opinion of probable construction cost at for each project bidding document submittal (40%, 80% and Final Draft). Prepare final opinion of probable construction cost prior to bidding.
- Quality Assurance/Quality Control: A Quality Control Plan (QCP) will be developed and implemented specifically for this project. At each project submittal stage, the document deliverables will be checked and reviewed by experienced personnel to ensure that the design meets applicable standards and normal engineering practice.
- Deliverables:
 - 40% Bidding Documents (Drawings and Technical Specification Outline)
 - 80% Bidding Documents (Drawings and Technical Specifications)
 - Final Draft Bidding Documents (Drawings and Technical Specifications)
 - Final Bidding Documents (One printed and one electronic set of Drawings and Technical Specifications)
- Bidding Phase
 - Conduct pre-bid meeting.
 - Respond to contractor inquiries.
 - Prepare construction document addenda, as necessary.



Review bids and supporting bid documentation. Prepare bid report summarizing bids, contractor references, and contractor qualifications; make recommendation for contract award.

- Construction Phase

Review and respond to contractor submittals (First two reviews are included in level of effort, subsequent review cost will be paid for by contractor)

Respond to contractor's request for information

Prepare monthly payment documents

Negotiate and prepare change orders for client review and approval

Attend monthly project meetings

Provide periodic onsite technical observer (have included two weeks per month in level of effort)

Develop record documents (provide one hard and one electronic copy to owner)

Specific Work Tasks:

Item 1 – Chemical Systems / Ozone

The Michigan Department of Environmental Quality (MDEQ) requires 30 days of redundant storage of the chemical used in this treatment process. To bring the rehabilitated plant into regulatory compliance with the chemical storage requirements for primary use, additional storage facilities will need to be constructed for liquid oxygen and nitrogen.

One liquid oxygen and one liquid nitrogen storage tanks and unloading stations identical to the existing units will be installed north of the existing facilities. Details are listed as follows:

- | | |
|----------------------------|-----------------------------|
| • Liquid Oxygen | Liquid Nitrogen |
| Capacity – 9000 gallons | Capacity – 540 gallons |
| Diameter – 10 ft (maximum) | Diameter – 5.5 ft (maximum) |

Pre-procurement documents for the liquid oxygen and nitrogen tanks will be provided.

Item 2 – Electrical

The City of Flint Water Treatment Plant (WTP) represents a combination of administrative, process, and maintenance facilities which all require electrical power. At the completion of Phase I of the water treatment plant rehabilitation projects, much of the electrical distribution equipment such as motor control centers (MCCs), power/lighting panels, transformers, and electrical power feeders will have been upgraded. There is, however, significant additional work required to address remaining electrical equipment that has reached a point of obsolescence.

Switchgear in the sub-station was installed around 1960. It is antiquated and difficult to maintain. Very little work has been done to the station since its original installation. The plant has two 46 kV primary feeds into the sub-station. Replacement of the distribution switchgear with current technology



equipment would allow a higher degree of load protection, be serviceable by numerous sources, and have replacement parts availability. When the switchgear is replaced, the plant will have to stay in operation. Brief interruptions of power of selected plant processes could be accommodated during cut over to new equipment.

Proposed Substation Upgrade

- Coordinate upgrades to Consumers 46kV primary feeders to provide a single overhead 46KV primary service
- ✓ • Replace the two Consumers 2.5kVA substation transformers and overhead structure with two 2.0 to 2.5 kVA 46KV pad-mounted transformers.
- ✓ • Replace the City's substation switchgear in the substation building.

Pre-procurement documents for the pad mounted transformers and switchgear will be provided.

Pump Station No.4 contains the largest electrical loads in the plant. Four low service pumps and five high service pumps represent a combined total of approximately 4000 horsepower. Additional loads from HVAC, lighting, controls, and chemical feed are about 60 kVA. This represents a total load of 531 amps @ 2400 volts. The existing switchgear in Pump Station No.4 is antiquated and difficult to maintain. Current technology equipment will allow a higher degree of load protection.

Proposed Pump Station No. 4 Improvements

- ✓ • Replace 2400V switchgear
- ✓ • Provide one 15 MGD medium voltage VFD

Pre-procurement documents for the medium voltage VFD and switchgear will be provided.

As a base load facility capable of producing water at any time the Flint WTP must have the ability to deal with power outages. In order to meet these electrical need in the event of a loss of power to the plant site or the loss of one of the substation transformers a new standby diesel generator is proposed to be located adjacent to the new substation.

Proposed Standby Power Improvements

- One 2.0 to 2.5 mVA generators and fuel tank.

Provisioned, but no actual generator

Pre-procurement documents for the generator set will be provided.

There are four 2400V to 480V transformers in Plant 2 that are antiquated and difficult to maintain. Replacement parts are no longer available and reliability is questionable.

Proposed Plant 2 Improvements

- ✓ • Replace two 300kVA 2.4KV transformer/switchgear.
- ✓ • Replace two 100kVA 2.4KV transformer/switchgear.



Pre-procurement documents for the transformers and switchgear will be provided.

Item 3 – Mid-Point Chlorination

Mid-point chlorination facilities are proposed to increase reliability of the disinfection process and improve Ct. For this initial stage the existing chlorine equipment in Pump Station No. 4 will be used and a new chlorine solution line will be installed from Pump Station No. 4 to the filter influent channel in Plant 2. A chlorine scrubber system will be installed in Pump Station No.4 to protect against a leaking chlorine ton container.

Proposed Chlorine Improvements

- New chlorine solution line to filter gallery.
- Chlorine system improvements.
- Dry scrubber system.

Item 4 – Low and High Service Pump Station No. 4

As a result of decreased demands, pumps at Pump Station No. 4 are “over-sized” and do not efficiently operate. Some of the pumps experience vibrations in the shafts and steady bearings. The existing pump station will be rehabilitated to replace “over-sized” pumps and obsolete equipment and provide needed maintenance.

Proposed Pump Station No. 4 Improvements

- Install one new High Service Pump (15 MGD @190 feet TH, vertically mounted pumps with 800 HP 2400/4160 V inverter duty motors, with 20 feet of shaft and steady bearings)
- Replacement of existing piping, valves, supports, and bearings
- New intermediate platforms, ladders, & stairs
- New ventilation (for exhausting heat from VFD's)
- Demolition of existing equipment to accommodate new equipment

Pre-procurement documents for the pump, motor, control valves and isolation valves will be provided.

Item 5 – Raw Water Piping Connection

The proposed KWA raw water pipeline will connect to the existing 72" PCCP finished water supply line near Center and Pierson Roads. (East of this connection, the 72" PCCP will be utilized by GCDC-WWS for distribution of finished water in the GCDC-WWS service area.) Raw water from Lake Huron will be conveyed to the WTP site via the 72" PCCP pipeline. On the WTP site, the 72" pipeline will be tapped for a 42" pipe and for a 36" pipe to convey raw water for treatment. Connections to the existing pipe will be made at this time to avoid future plant shutdowns for connections.

Proposed Pump Station No. 4 Improvements

- 48-inch pipe connections
- 36-inch pipe connection
- 54-inch pipe connection

Pre-procurement documents for the valves and connection fittings will be provided.

Phase II – Segment II:

The proposed upgrade for item 6 has been categorized as Phase II – Segment II and is to be completed with the same urgency as the rest of the work so that the WTP can be utilized to treat water from the river in the spring of 2014. However, the use of the Bray Road lagoon for other disposal activities will require that this issue be addressed independently to certain extent as to isolate the problem areas while working with MDEQ to permit its use for lime sludge disposal.

Item 6 – Softening Residuals Disposal

Develop, evaluate, design and implement a lime residuals disposal plan to handle softening sludge for the interim period of operation using the Flint River as a water source. These options may include the use of Bray Road lagoon, construction of temporary dewatering and loading facilities, and other temporary storage options.

The use of Bray Road Lagoon will require additional survey, geotechnical and environmental testing at the site in order to assess the condition of the lime sludge in the basin and to verify the capacity of the lagoon system. Based on the findings of this evaluation, proposed improvements will be designed to accommodate the use of the facility in the interim basis while addressing some of the MDEQ concerns about the site and any unauthorized discharges into the nearby stream. Permitting for site use will be incorporated as part of the overall design improvements at the WTP and submitted to the MDEQ at the 80% design stage for their pre-permit review and comments. A final package will be submitted to the MDEQ at the 100% design stage for permit issuance and approval of work plan.

Pre-procurement documents for specific equipment may be provided as needed.

3. Schedule

The work included in this work authorization is anticipated to be performed in accordance with the following schedule, based on the Notice-To-Proceed (NTP) date of November 1, 2013. For the purposes of this proposal, we anticipate a 3 month design phase and 1 month bid phase. Schedule revisions may be necessary as information becomes available and work priorities change.


Project Milestone
Date

Project Kickoff Meeting	November 6, 2013
Equipment Procurement Documents	December 6, 2013
Submit 40% Bidding Documents	December 18, 2013
Submit 80% Bidding Documents	January 10, 2014
Submit Final Draft Bidding Documents	January 31, 2013
Submit Final Bidding Documents	February 7, 2014
Bid Advertising	February 10, 2014
Pre-Bid Meeting	February 17, 2014
Bid Opening	TBD by City
Recommendation of Contract	TBD by City
Contract Award issued by City	TBD by City

4. Compensation

The Reimbursable Compensation method with a maximum not-to-exceed limit will be used for this contract. Labor rates shall be based on personnel classifications according to the existing rate sheet. Reimbursable expenses shall be invoiced at the actual cost times a factor of 1.0 for processing and handling. The estimated maximum not-to-exceed fee for this project is \$962,800 which includes a \$15,000 allowance for surveying and \$15,000 allowance for geotechnical services.

<u>Description</u>	<u>Fee</u>
Design and Bidding Assistance	\$ 752,800
Surveying Allowance	\$ 15,000
Geotechnical Allowance	\$ 15,000
Construction Phase Services	\$ 180,000
Total Maximum Not to Exceed Fee	\$ 962,800

Any other work beyond the Scope of Services herein will require a subsequent Work Authorization with prior approval from the City.

May 21, 2013

TO: Brent Wright, Supervisor
Water Plant

FROM: Derrick F. Jones,
Purchasing Manager

SUBJECT: SEALED BIDS

Attached are the sealed bids that were received for the annual supply of LOX-liquid Oxygen for your review. These copies are yours to keep. The proposals were opened on May 14, 2013 under proposals #14-513.

Your review and recommendation are needed as soon as possible. Attach a staff resolution form when you send back your recommendation and make sure that your requisition has been updated and pre-encumbered with the correct price. If your recommendation is under \$10,000.00, you do not need to include a staff resolution form.

Please note: if your project is being funded by any grants issued by the federal government, you must go to www.sam.gov to ensure that the selected vendor has not been debarred.

Attachment



Mr. Brent Wright

City of Flint, Water Treatment Plant

4500 N. Dort Highway

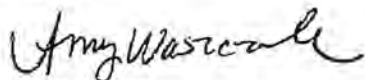
Flint, MI 48505

Mr. Wright,

Air Liquide Industrial U.S. LP appreciates your business and the opportunity to provide the City of Flint with a reliable and economic supply of bulk liquid oxygen. Air Liquide strives for quick and reasonable turn-around time for your oxygen deliveries when your order is placed with the National Scheduling Center. Air Liquide's typical standard delivery time frame is within 24 to 48 hours upon order.

Thank you and please call me directly at 708-579-7977.

Sincerely,



Amy Waszczak

National Municipal Business Coordinator

Air Liquide Industrial U.S. LP

REQUIREMENTS / TABULATION**Treatment Chemical Specifications****Flint Water Plant**

- Product to meet or exceed AWWA Standard B510-00 Column H of Table 1 and ANSI/NSF 60, see attached table.
- Delivery to be by pressurized vessel tanker truck, not to exceed 20 ton deliverable product and conforming to all applicable local, state and federal regulations.
- Trailer must have proper DOT markings, including the nomenclature "Guaranteed by VENDOR to meet the requirements of AWWA B510 Standard for".
- Weight Certificate from certified weigher, supplied by selected vendor for each delivery. Certified liquid meter tickets may be acceptable substitute.
- Purity Standards with certification for every load. Affidavit of certified analysis. O2 Purity must be 99.5%
- Copy to owner of selected vendor's QC/QA program.
- Water Plant Staff training for the initial load to bulk storage.
- The vendor shall contact the Water Plant Supervisor 24 hours prior to delivery to confirm. 810-787-6537.

LOX-LIQUID OXYGEN 99.5%
FOR USE IN STATE MANDATED PLANT TEST RUNS

CONTACT PHONE#: 810.785.7877

FURNISH AS REQUESTED FOR THE PERIOD 7/1/13 - 6/30/14.
APPROXIMATE QUANTITIES, NOT GUARANTEED

FOR MORE INFORMATION CONTACT:
BRENT WRIGHT @810.787.6537 EXT# 3510

LIQUID OXYGEN TO BE USED IN OZONE PROCESS.

\$ 0.381 /cu ft. *

Only the specifier has the responsibility and judgment for determining whether a proposed substitution is an "or equal or exceeding" specification. Mfg., model #, and supporting documentation of specifications for alternates must be provided.

* Amendment Number 2 to the ⁹existing Bulk Product Agreement is made a part of Air Liquides bid for bulk liquid oxygen.

THIS PAGE MUST BE COMPLETED AND INCLUDED WITH SUBMITTAL:

The undersigned hereby certifies, on behalf of the respondent named in this Certification (the "Respondent"), that the information provided in this offer submitted to the City of Flint is accurate and complete, and that I am duly authorized to submit same. I hereby certify that the Respondent has reviewed all documents and requirements included in this offer and accept its terms and conditions.

Cash Discounts will be computed from the date of receipt of invoice. Prices firm unless stated otherwise by bidder. Delivery can be made in () days ARO (after receipt of order).

Payment Terms: 30 Delivery Dest.: F.O.B. Fed. ID #: 90 0186946
(All Freight Terms are considered F.O.B., Prepaid unless otherwise noted by seller)

COMPANY NAME (Respondent): Air Liquide Industrial US LP
(Printed)

ADDRESS: 5220 East Avenue

CITY/STATE/ZIP: Countryside IL 60525

PHONE: 708-579-7977 FAX: 708-579-7933

EMAIL: amy.waszczak@airliquide.com

PRINT NAME and Title: Amy Waszczak, Municipal Business Coordinator
(Authorized Representative)

SIGNED: Amy Waszczak DATE: 5/13/2013
(Authorized Representative)

Please submit original documents plus one copy.

New vendors are required to complete and submit an IRS W-9 Form and Vendor ACH Form with the City of Flint. Link is available at www.cityofflint.com/finance/purchasing.

Bid results may be viewed next business day online at www.cityofflint.com/finance/purchasing



Technical Bulletin Vacuum Tubing & Piping

Vacuum Tubing / Piping Sizing Guide for Chlorine & Sulfur Dioxide

Gas Feed Rate	100 ft.	200 ft.	300 ft.	500 ft.	1000 ft.	1500 ft.
50 PPD / 1 kg/h	3/8"	3/8"	1/2"	1/2"	1/2"	5/8"
100 PPD / 2 kg/h	3/8"	1/2"	5/8"	5/8"	3/4"	3/4"
250 PPD / 5 kg/h	1/2"	5/8"	3/4"	3/4"	1"	1"
500 PPD / 10 kg/h	5/8"	3/4"	1"	1"	1-1/2"	1-1/2"
1000 PPD / 20 kg/h	1"	1"	1-1/2"	1-1/2"	1-1/2"	1-1/2"
2000 PPD / 40 kg/h	1"	1-1/2"	1-1/2"	2"	2"	2"
4000 PPD / 80 kg/h	1-1/2"	1-1/2"	2"	2"	2"	3"
6000 PPD / 120 kg/h	1-1/2"	2"	2"	2"	3"	3"

NOTES:

1. In the above table:
 - a. 3/8", 1/2" and 5/8" refer to the OD (outer diameter) of flexible polyethylene plastic tubing.
 - b. 3/4", 1", 1-1/2", 2" and 3" refer to Schedule 80 PVC rigid piping.
2. The above recommendations are based on calculations limiting friction loss to 0.5" Hg or less.

WTP - Rehab
Phase 2 = Seq 1

CL₂ B4D

GAS CL₂ COT SHS

LOX, LN CALCS

City of Flint
Water Treatment Plant Improvements
Midpoint Chlorination System Basis of Design

Basis of Design for Midpoint Chlorination:

Q, Design Max Day = 18 MGD

Cl₂ Dosage, Max = 5.5 mg/L [per City of Flint plant staff]

Cl₂ Usage, Max = 18 x 5.5 x 8.34 = 826 ppd Cl₂

Provide minimum 1,000 ppd gas chlorination system.

*assume 3.0 mg/L demand
 100% 2.5 mg/L Avail
 → meets 10 states of
 4.4.1.2 of
 2.0 mg/L min*

Proposed Gas Chlorination System:

1. Four (4) 500 ppd Cl₂ vacuum gas feed systems with chlorine solution piping manifold for total installed capacity of 2,000 ppd Cl₂.
2. Each 500 ppd Cl₂ vacuum gas feed system shall consist of the following:
 - a. One (1) 500 ppd vacuum regulator (direct mounted to chlorine ton containers or remote mounted). Each unit shall include an actuator for emergency closure of the chlorine container valve. Vacuum regulators shall be Hydro Instruments Series 700 with integral drip leg and heater.
 - b. One (1) wall mounted control panel with the following equipment:
 - i. One (1) automatic valve for feed rate control, Hydro Instruments Omni-Valve Model OV-110.
 - ii. One (1) 500 ppd rotameter, Hydro Instruments Model RM-701.
 - iii. One (1) vacuum monitor, Hydro Instruments Model VM-150.
 - iv. One (1) 500 ppd differential pressure regulator, Hydro Instruments Model DP-500.
 - v. PVC bypass piping.
 - c. One (1) 500 ppd ejector nozzle/check valve assembly, Hydro Instruments Model EJ-5000
3. One (1) existing chlorine gas leak detector as manufactured by MSA.
4. Four (4) existing ton container load cells.

Note: All new equipment shall be as manufactured by Hydro Instruments of Telford, PA. Catalog cutsheets for all new equipment are attached.

Description of Operation:

Each 500 ppd Cl₂ gas feed system will operate based on signals from the plant PLC. Based on operator set dosage, the PLC will send a signal to open the water supply solenoid valve(s) that will allow supply water to flow through the ejector(s) to create the vacuum necessary for gas flow from the ton container(s). If the set point is less than 500 ppd, only one solenoid valve will open. If the set point is greater than 500 ppd, two solenoid valves will open, and the other two 500 ppd systems will remain as standby units. Initially, the dosage will be controlled by the operator manually adjusting the setpoint at the PLC. However, the system has the capability of automatically controlling the feed rate through a flow pacing signal or through a chlorine residual analyzer compound feedback loop.

*→ Auto
 Proportioning
 4.4.1.5*

Each 500 ppd system will be fed from a single one ton chlorine container with its own load cell to monitor chlorine usage. The PLC will monitor each load cell and will signal an alarm when the container is empty; the PLC will automatically close the solenoid valve for the 500 ppd system with the empty container and will start one of the standby units so that the empty ton container can be changed out.

— *status
switch
yes*
↓
next
4.4.1.4

Estimated Chlorine Feed Rates - lbs./day

Examination of previous chlorine demand tests and past plant operation data using Flint River water, shows a chlorine demand around 3.0 mg/L on average. The chart below shows the pounds per day of chlorine that will need to be applied for different flows and different chlorine dosages that may be encountered.

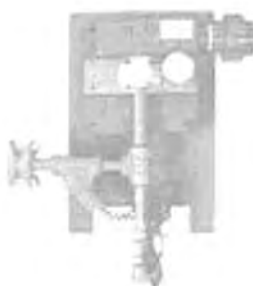
		Chlorine dosage (mg/L)						
		3	4	4.5	5	5.5	6	6.5
Flow (MG)	12	300.2	400.3	450.4	500.4	550.4	600.5	650.5
	18	450.4	600.5	675.5	750.6	825.7	900.7	975.8
	24	600.5	800.6	900.7	1000.8	1100.9	1201.0	1301.0

In order to produce a 1.5 mg/L chlorine residual in finished water to meet Ct requirements, the dosage will most likely be between 4.5 & 5.5 mg/L. The demand may increase if ozone production decreases, or if the source water contains large amounts of turbidity during spring runoff, or heavy rains.



Highest Quality

Gas Chlorination Systems





Application: Gas chlorination systems are used for water disinfection and other purposes in a variety of applications. Compared to other disinfection methods, chlorine offers the advantage of a stable and long lasting residual that can remain in the water protecting it from recontamination after treatment. Among chlorination methods, chlorine gas is the most economical and the equipment is also the most reliable and easy to operate. Some of the most common applications for large scale gas chlorination systems are surface water treatment plants, waste water treatment plants, and cooling towers for power plants, oil refineries, etc... Gas chlorination systems are also used in a variety of industrial, mining, and agricultural applications.

Purpose: Regardless of the application, the gas chlorination system will be required to inject chlorine gas into the process water at one or more locations (with the goal of achieving a desired level of residual chlorine to the process water). Different applications have different requirements for the residual chlorine concentration depending on the water quality and the application. Chlorine residual is quantified in units of parts per million (PPM or mg/L). In order to maintain a constant residual in the water, as the process water flow rate increases and decreases the chlorine feed rate should proportionally increase and decrease. It also must be realized that a certain amount of chlorine will be consumed in reactions upon entering the process water and that this amount of chlorine will not be available as chlorine residual. The amount of chlorine residual consumed in this way is sometimes referred to as the chlorine demand of the water (in units of PPM). The chlorine demand is different for every process water and can range from close to zero to over 20 PPM. Keeping the above points in mind, the following equation is used to determine the required chlorine gas feed rate for each chlorine gas injection point:

$$[\text{Process Water Flow (m}^3\text{/hr)}] \times [\text{Dosage (PPM)}] = \text{Chlorine Gas Feed Rate (gr/hr)}$$

NOTES:

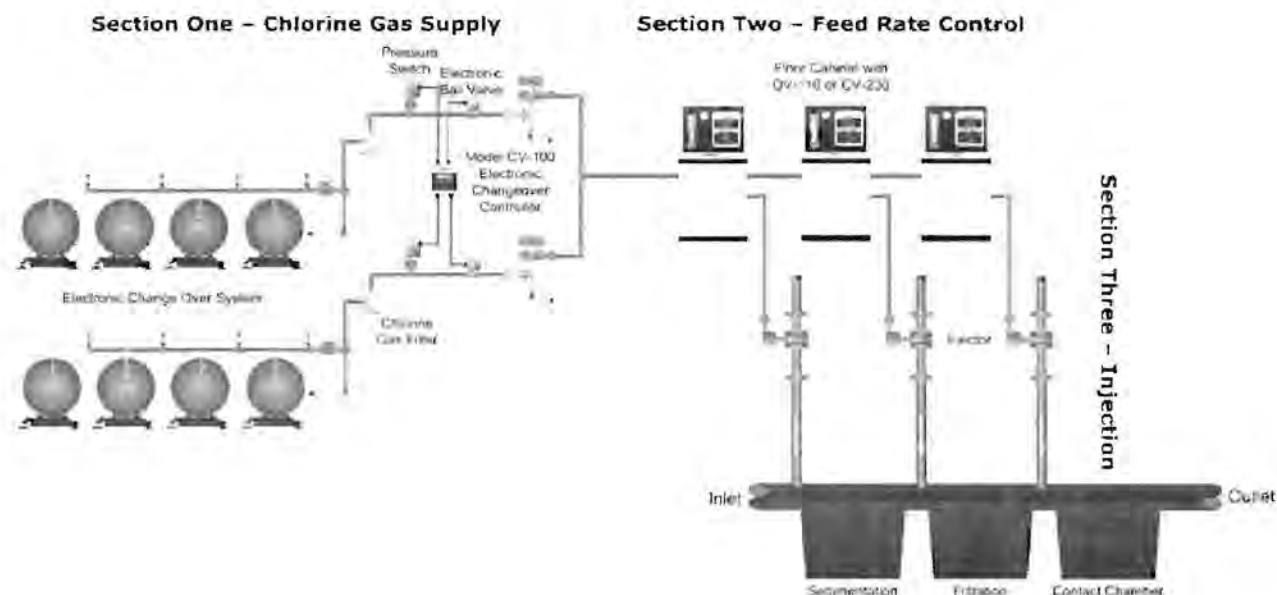
Water Flow (m³/hr) = Process water flow rate in cubic meters per hour

Dosage (PPM) = [chlorine demand] + [desired chlorine residual]

System Example (Surface Water Treatment Plant): Figure 1 shows a very basic schematic of a surface water treatment plant. The diagram shows three chlorine gas injection points. One gas chlorination system with three injection points is shown in the diagram. The gas chlorination system can be broken down into three sections as indicated in Figure 1,



Figure 1: Surface Water Treatment Plant (Example)



Typical: Gas chlorination systems follow a modular design principle. As seen in Figure 1 above, the gas chlorination equipment can be divided into three sections starting from the chlorine gas containers and ending at the ejectors as follows:

- (1) **Chlorine Gas Supply** – This part of the system is designed to provide an uninterrupted supply of chlorine gas flowing under vacuum.
- (2) **Feed Rate Control** – In this section, equipment is provided to monitor and control the feed rate of chlorine gas to each injection point. The feed rate control can be manual or automatic based on 4-20mA input signals from water flow meters or residual chlorine analyzers. (Step feed control based on switch inputs is also available.)
- (3) **Ejector System** – The ejectors create the vacuum that operates the system in an on-off fashion. The chlorine gas enters the water inside the ejector and then the chlorinated water solution is piped to the injection point where it is delivered to the main process water flow.

Safety and monitoring equipment such as gas leak detectors, residual chlorine analyzers, container scales, emergency valve closure systems, emergency repair kits, and chlorine leak absorption systems (scrubber systems) are also available from Hydro Instruments and our sales representatives.

There are many options available for designers to select. This document will review general options for each stage of the system. Please also refer to additional Hydro Instruments product literature for additional details.



Figure 2 is a diagram depicting several of the more common equipment configurations for each part of the gas chlorination system. This figure shows three different options for the chlorine gas supply section and four different options for the feed rate measurement and control section of a system.

Note that one chlorine gas supply section is frequently used to supply chlorine gas to multiple injection points.

Figure 2: System Layout Options

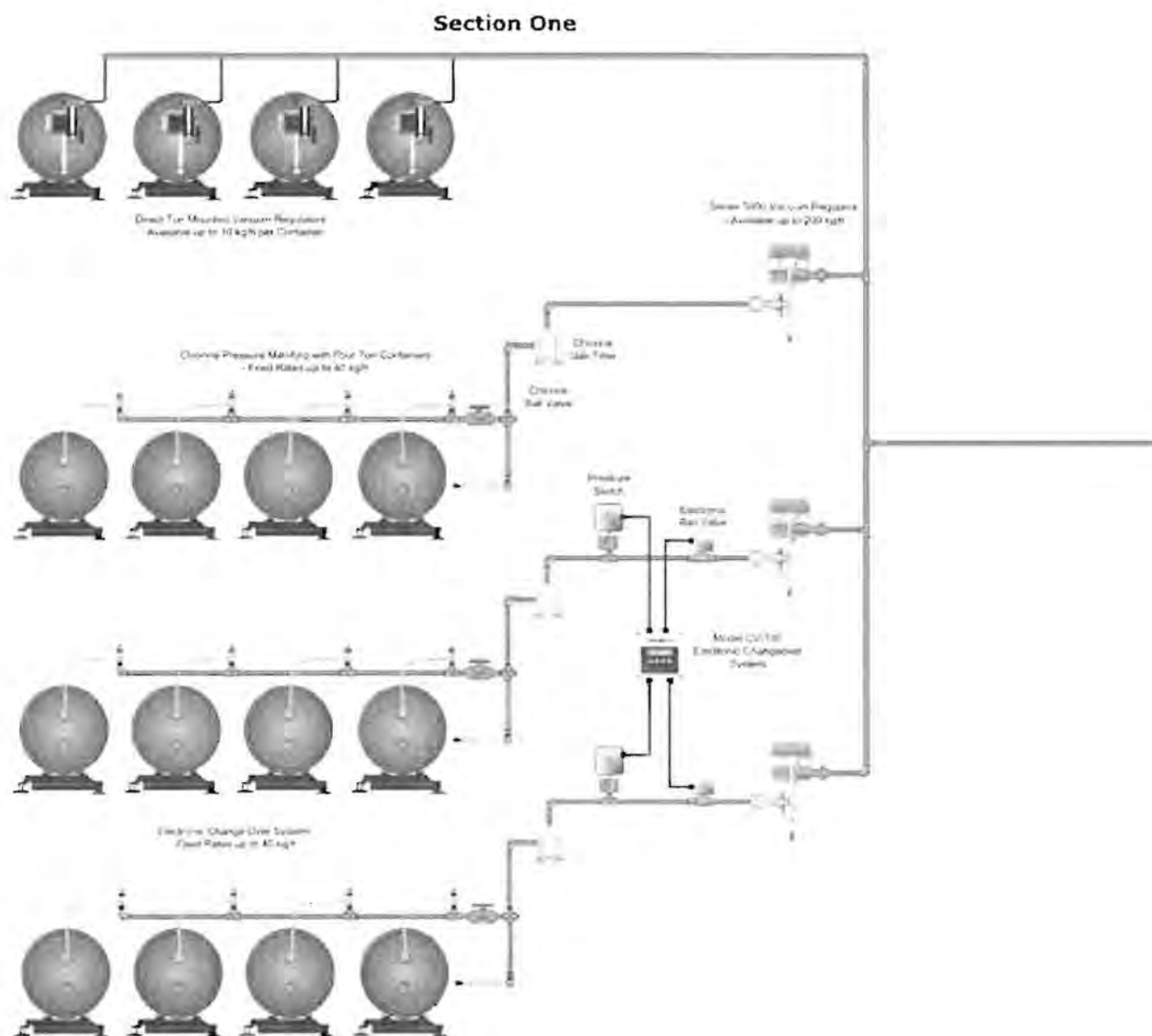
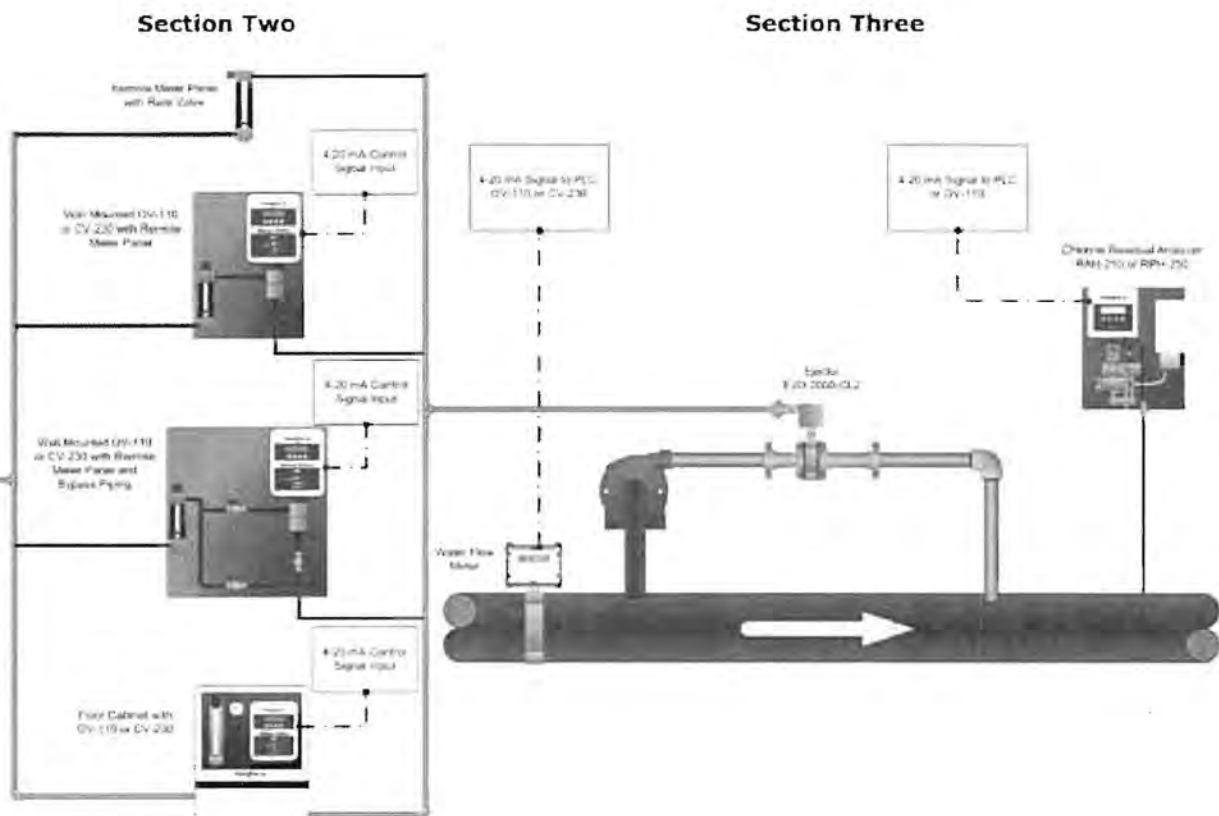


Figure 2: System Layout Options



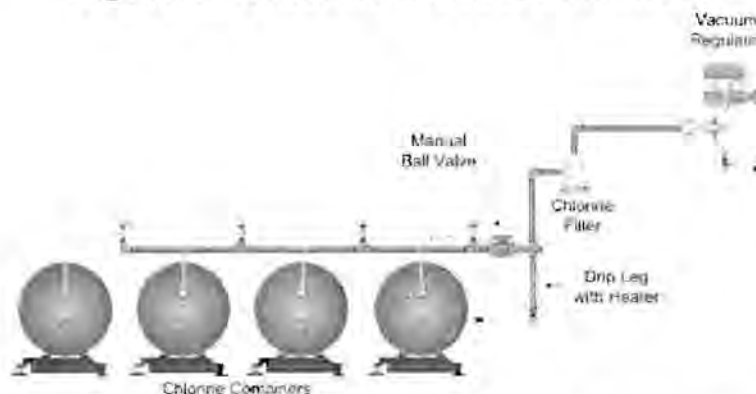


Section 1 – Chlorine Supply: This section of the equipment consists of the chlorine containers, manifolds, vacuum regulators and changeover system.

- 1a. Ton Containers & Chlorine Manifolds:** NOTE: For more detailed technical information, please refer to the latest copy of Hydro Instruments TCM-DC design guide for ton container mounted manifolds.

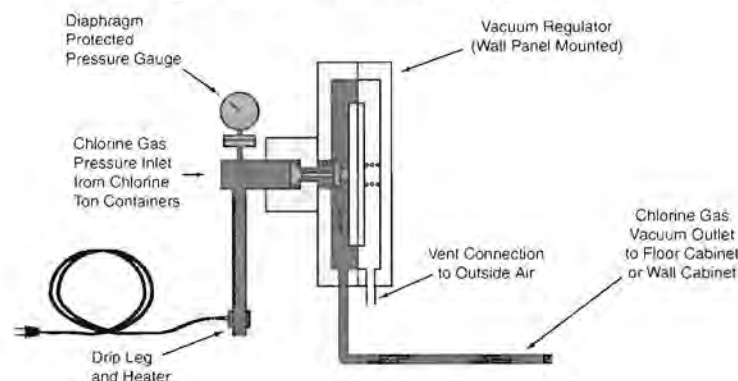
Evaporation cooling limits the chlorine gas withdrawal rate for a single chlorine ton container to approximately 10 kg/hr (500 PPD). Therefore, a 40 kg/hr (2000 PPD) system should be designed so that four ton containers are feeding simultaneously. This can be accomplished by mounting a vacuum regulator on each ton container or by connecting four ton containers together with a pressurized manifold. Pressurized chlorine manifolds are used to collect chlorine gas from one or more chlorine ton containers. The manifold must trap and evaporate liquid chlorine to prevent it from entering and damaging the vacuum section of the equipment.

Figure 3: Chlorine Pressure Manifold



- 1b. Vacuum Regulators:** Chlorine gas enters the vacuum regulator under pressure. When the ejector is in operation it creates a vacuum (that vacuum extends to the rear cavity of the vacuum regulator) that causes the diaphragm assembly to press back against the spring loaded normally closed inlet valve, causing it to open and allow chlorine gas to flow in under vacuum conditions. When vacuum is lost for any reason, the inlet valve spring will close the valve and stop the flow of chlorine immediately.

Figure 4: Vacuum Regulator



***The most durable
gas chlorinator
on the market...***

hydro

SERIES 700 AND 750

**GAS
CHLORINATORS**



For...

- Potable Water Systems • Industrial Process Water
- Sanitary Sewage • Industrial Waste Water
- Community Water Systems • Power Plants • Swimming Pools & Fountains

EASY INSTALLATION: Advanced product design eliminates the probability of troublesome installations.

FEWER PARTS: Proven product engineering results in fewer parts for exceptional operating reliability, lower cost, and longer life.

TOTAL RELIABILITY: Every part is optimally designed and manufactured using materials proven to be chemically resistant to chlorine gas. Therefore, Hydro Instruments' Series 700 and 750 components can be used to handle chlorine gas with safety and complete control at capacities up to 500 lbs/day (10,000 grams/hour).

hydro INSTRUMENTS



HYDRO GAS CHLORINATORS

Principle of Operation

For a particular ejector back pressure, a minimum water supply is required at the ejector inlet to create vacuum at a level strong enough to operate the chlorinator. This vacuum originates in the throat of the ejector's Venturi nozzle and after opening the ejector check valve, extends into the body of the chlorinator. There it causes the regulating diaphragm to open the inlet safety valve, allowing gas under pressure to pass into the drip leg where the initial liquid is collected. A heater attached to the drip leg evaporates the liquid that is in the eduction tube of the gas valve on startup of a new ton container. This heater remains on constantly, permitting only gas to flow to the vacuum regulator. As it flows across the inlet safety valve assembly, it is filtered and reduced to a vacuum.

The gas then enters a chamber where the vacuum level is maintained by a spring-opposed, sealed regulating diaphragm. It is then drawn through the chlorine flow meter, across the rate control valve and on to the ejector where it dissolves in water. The resultant, highly concentrated solution exits at the ejector outlet and flows to the desired point of application.

Accuracy

Flow meter accuracy is within 4% of the meter's maximum capacity.

Capacities Available

Maximum total operating rate is 500 pounds per day (10,000 grams per hour). Minimum feed rate is 5% of maximum.

Installation of Hydro Gas Chlorinators

Units of the **Hydro Gas Chlorinator System** can be used for practically any requirement. The schematics show various types of installations using single or multiple containers as well as application of chlorine to pool, basin or pipeline...direct or remote. Basic **Hydro** gas chlorinator units are simply combined to cover all applications.

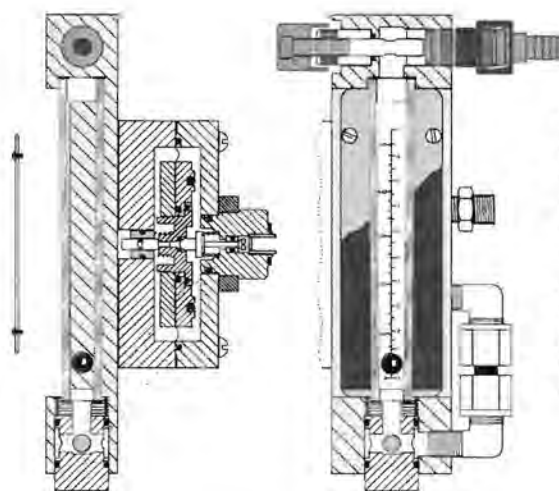
CHLORINATOR SIZE SHOULD BE BASED ON MAXIMUM POSSIBLE FLOW.

$$\text{GPM} \times 0.012 \times (\text{PPM}) \text{ Dosage} = \text{PPD}$$

Example:

$$600 \text{ GPM} \times 0.012 \times 3 \text{ PPM} = 21.6 \text{ PPD}$$

In this example a **Hydro** 50 PPD chlorinator would be adequate.



HYDRO Series 700 Chlorinator

A ton ironwork* is used to mount the **Hydro** chlorinator directly to the container. **This eliminates all pressure lines.** Chlorine gas is taken under vacuum to the point of injection. **This eliminates pressurized solution lines.**

Operator Indicator

During operation the indicator window remains gray; red indicates depletion of the chlorine source.

Inlet Safety Valve

Spring opposed safety valve seals off chlorine in container upon loss of vacuum. Safety valve is encapsulated to permit quick disassembly and cleaning without special tools.

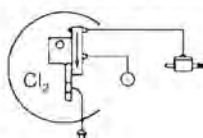
Inlet Sealing Valve

A sealing valve at the chlorinator inlet closes if chlorine supply is interrupted or depleted, sealing the entire vacuum system. Dirt or moisture cannot enter the system when containers are changed.

Regulating Diaphragm

Constant vacuum level is maintained inside the chlorinator by the diaphragm which is O-ring sealed along its entire inner and outer surface to prevent leakage or warping of parts from excessive tightening of the body bolts.

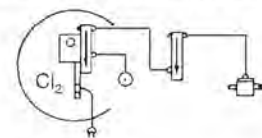
500 PPD systems with one or more wall mounted remote meter(s) (701, 701-2, 702, 702-2, etc.) are standard with chlorinator body(ies). The price is reduced if the customer wishes to receive chlorinator(s) with no meter assembly(ies) ("blank" at the source (only at the wall mounted remote meter) and on automatic standby systems one will not be able to visually deter-



Hydro Model 700
Single-Point Application

Hydro chlorinator mounted on a single container with direct ejector to pipeline or basin. Chlorine capacity to 500 PPD (10,000 grams/hr).

⊖ Vent to safe outside location

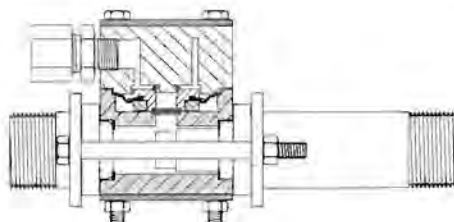


Hydro Model 701
Remote Meter for Single Point of Application

Hydro chlorinator mounted on a single container feeding a remote wall mounted meter with rate valve supplying a single ejector. Chlorine capacity to 500 PPD (10,000 grams/hr).

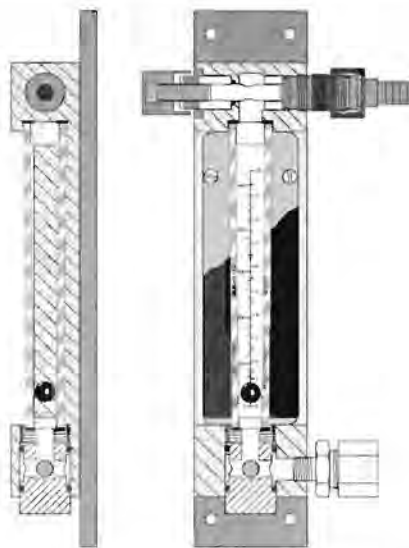
* The Series 750 is the same as the Series 700 but without the ton ironwork. The Series 750

A complete system for totally reliable control.



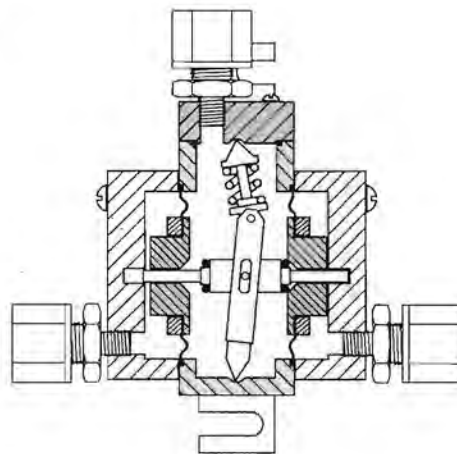
HYDRO EJ-5000 Ejector

The **Hydro** ejector utilizes a specially designed O-ring seal check valve which prevents the backflow of water into the chlorinator. The ejector operates on a venturi created by water passing through the ejector nozzle causing the spring opposed diaphragm check valve to open and mix the chlorine gas with the water. The ejector should be supplied with reasonably clean water at temperatures below 80°F (27°C). The **Hydro** ejector is made of durable materials that are resistant to wet and dry chlorine gas use.



HYDRO RM-701 Remote Meter

Any number of **Hydro** Remote Meters may be used in an installation if required. Only the vacuum line is required to the individual ejector which it supplies. Chlorine gas can then be precisely metered at each remote location. If more (or less) is required at one location the meter is simply set at the desired level for that location. By this control of metering at remote locations a perfectly balanced system can be maintained. **Hydro** Remote Meters are practically maintenance free. **Hydro** Remote Meters use a solid silver rate valve. Flow meters are accurate to $\pm 4\%$.



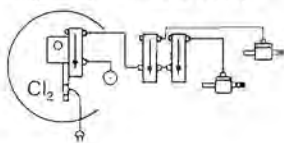
HYDRO SW-500 Automatic Swichover

Multiple chlorine containers, which prolong the time span before depletion, are easily installed and automatically switch over from a depleted container to the unused container. A **Hydro** Chlorinator is installed on each container and only one Automatic Swichover is required to handle the two containers. The **Hydro** Automatic Swichover can be used with either one remote meter or with two or more remote meters. Use of this swichover module is a great time saver and is a great aid in assuring a more constant supply of chlorine. Once installed, the **Hydro** Automatic Swichover is completely automatic and needs no adjustment or setting.

hydro INSTRUMENTS

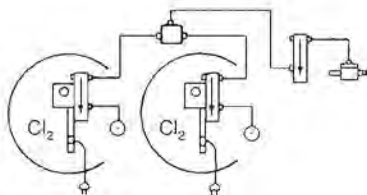
600 Emlen Way, Telford, PA 18969 • Telephone: (215) 799-0980 • Fax: (215) 799-0984
Toll Free in the U.S.: 1 (888) 38-HYDRO • www.hydroinstruments.com • sales@hydroinstruments.com

ers that have a remote meter without a rate valve ("plugged") on the 3d"), however it will not be possible to measure the chlorine feed rate mine which unit is regulating the chlorine supply.



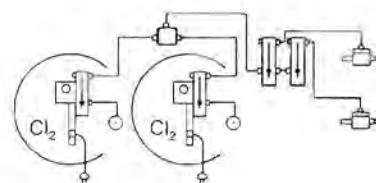
Hydro Model 701-2
Multi-Point Application

Hydro chlorinator mounted on a single container feeding two remote meters for two points of injection using two ejectors. Each meter and ejector operates independently. Chlorine capacity to 500 PPD (10,000 grams/hr).



Hydro Model 702
Automatic Stand-By

Hydro chlorinators – two chlorinators mounted on two containers with swichover module feeding one remote meter with rate valve feeding a single ejector. Capacity to 500 PPD (10,000 grams/hr) maximum.



Hydro Model 702-2
Automatic Stand-By with Multi-Point Feeding

Hydro chlorinators – two chlorinators mounted on two containers with swichover module feeding two or more remote meters with rate valves supplying two ejectors. Capacity to 500 PPD (10,000 grams/hr) maximum.

chlorinator comes complete with a yoke assembly and is used for manifold mounting.

Series 700 and 750 GAS CHLORINATORS

The installation of **Hydro Gas Chlorinators** is easily accomplished. The following will be useful information.

System Operating Temperatures

For best operation and safety, the chlorinator and chlorine supply should be protected from the elements and from direct sunlight.

Methods of Control

Manual

Adjustment of rate valve and start/stop of water to ejector.

Semi-Automatic

- Shutting off booster pump to ejector.
- Using solenoid valve to close vacuum line to ejector.

Step-Feed to multiple flow meters is available using solenoid valves in the vacuum line or water line to the ejector.

STANDARD TUBING CONNECTIONS

Vacuum Tubing Size		Vent		
Feed Rate		Length of Tubing		
		100 Feet (30m)	200 Feet (60m)	25 Feet (7.5m)
PPD	Gr/Hr			
50	1000	3/8" (9.52mm)	3/8" (9.52mm)	3/8" (9.52mm)
100	2000	3/8" (9.52mm)	1/2" (12.7mm)	3/8" (9.52mm)
200	4000	1/2" (12.7mm)	5/8" (15.8mm)	3/8" (9.52mm)
500	10,000	5/8" (15.8mm)	3/4" (19mm)	3/8" (9.52mm)

ACCESSORY EQUIPMENT AVAILABLE

- Loss of Chlorine Alarm
- Multiple Remote Flow Meters and Ejectors
- Inlet Water Assemblies
- Automatic Switchover System
- Booster Pumps
- Gas Masks
- Analyzers
- Leak Detectors

CHLORINE WITHDRAWAL RATE from Horizontal Ton Container

Maximum Chlorinator Withdrawal Capacity		Minimum Ambient Temperature	
PPD	gr/hr	°F	°C
500	10,000	40	4
250	5000	16	-9
150	3000	0	-18
100	2000	-6	-21
50	1000	-20	-29

Ejector Installation

1. Ejector connections must be kept above freezing temperatures.
2. At point of application maximum back pressure for standard ejector is 100 psig. (High pressure ejectors are available.)
3. Long solution lines from ejector should be avoided and if not, solution lines must be of adequate ID to reduce friction loss.
4. To create a vacuum the water supply to the ejector inlet must be higher than the pressure at the point of application (approximately 40 psig differential).
5. Maximum ejector operating temperature is 110° F (43° C).
6. Ejector may be wall mounted for remote applications.

Series No.	(PPD) Maximum Capacity	Mounting
500 Series	100 PPD (2000 gr/hr)	150 lb. cylinder, manifold*, or ton container
200 Series	200 PPD (4000 gr/hr)	150 lb. cylinder, manifold*, or ton container
700 Series	500 PPD (10,000 gr/hr)	Ton container
750 Series	500 PPD (10,000 gr/hr)	Manifold

* For manifold units there is the additional cost of wall mounting manifolds.

Hydro Model EJ-5000 (500 PPD) Ejector Connections

	Standard	Options
Ejector Water Inlet (Nozzle)	EN-296 Nozzle for 1 1/4" NPT	EN-275 Nozzle for 1 1/4" NPT
Ejector Water Outlet (Diffuser)	EDH-560 Diffuser for 1 1/2" ID Hose	EDT-560 Diffuser for 1 1/4" NPT

Represented by



INSTRUMENTS





Vacuum Regulators

Hydro Instruments manufactures many different designs of vacuum regulators. Some of the most common configurations are shown in the following table. Other designs and configurations are available. Please review our website for more information.

750

- 10 kg/hr
- Optional flow meter
- Optional direct ton container mounting



750W-DL

- 10 kg/hr
- Optional flow meter
- Wall-mounted
- Optional drip leg and heater
- Diaphragm protected pressure gauge



SVR-500-CL2

- 10 kg/hr
- Integral vacuum switchover design
- Optional flow meter (5 kg/hr maximum)
- Wall-mounted
- Optional direct ton container mounting



VRH-2000-CL2

- 40 kg/hr
- Drip leg and heater
- 3/4" Steel Union Inlet
- 1" PVC Union Outlet
- Diaphragm protected pressure gauge
- Optional flow indication tube



VRH-8000-CL2

- 150 kg/hr
- Drip leg and heater
- 3/4" Steel Union Inlet
- Y-Strainer Inlet Filter
- 1.5" PVC Union Outlet
- Diaphragm protected pressure gauge
- Optional flow indication tube



VRH-10000-CL2

- 200 kg/hr
- Drip leg and heater
- 3/4" Steel Union Inlet
- Y-Strainer Inlet Filter
- 2" PVC Union Outlet
- Diaphragm protected pressure gauge
- Optional flow indication tube





1c. Changeover Equipment: Hydro Instruments offers three types of automatic changeover equipment. The function of this equipment is to automatically switch the chlorine gas supply to the standby manifold when the duty manifold containers are empty.

- i. Vacuum Switchover by integral switchover vacuum regulators (Series 900):** This equipment is only available for feed rates up to 10 kg/hr (500 PPD). The Series 900 vacuum regulator design offers automatic switchover based on the high vacuum condition that occurs when the duty chlorine containers are going empty. Once the duty containers are nearly empty, the vacuum level in the system will increase and cause the standby vacuum regulator to switch automatically into the feeding position. The advantage of this system is its simplicity and low cost.

Series 900 System (10 kg/hr)	Series 900 Vacuum Regulator

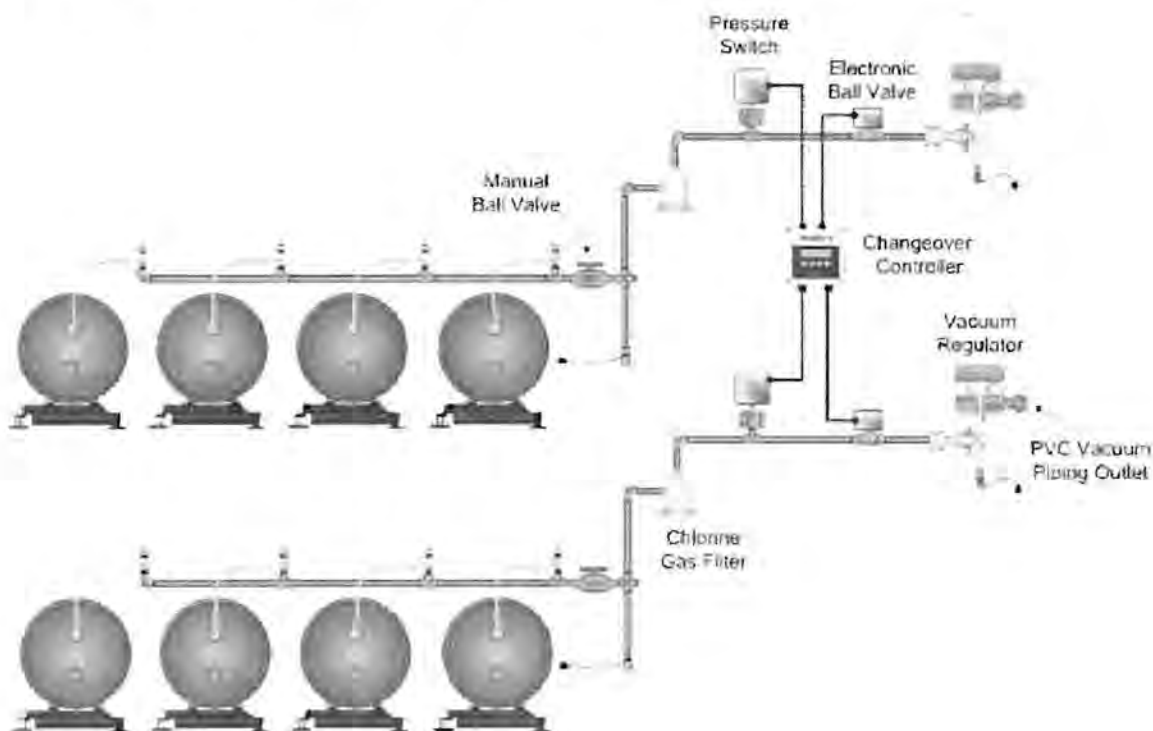
- ii. Vacuum Switchover Modules:** The operation of the vacuum switchover is also based on the rising vacuum level that accompanies the duty manifold ton containers going empty. The switchover module includes a spring loaded mechanism and two diaphragm assemblies. The advantage of this type of switchover mechanism is again the simplicity and relatively low cost.

Model 3105C System (20 kg/hr)	SOH-4000-CL2 (80 kg/hr max.)



- iii **Electronic Changeover System (Series CV-100):** The Hydro Instruments Series CV-100 automatic changeover system is designed to allow continuous supply of chlorine gas when using a duty/standby gas container system layout.

Figure 5: Series CV-100 Electronic Changeover System



The system consists of a dedicated controller Model CV-100 designed for this application, two pressure switches, and two electronically actuated ball valves. In normal operation, the Model CV-100 controller will keep one of the ball valves open (duty) and the other closed (standby). Upon receiving a low pressure alarm relay signal indicating that the duty gas supply source is nearly depleted, the controller will close the duty ball valve and open the standby ball valve. After such a changeover event, the operator will be required to silence the changeover alarm, change the empty containers, and then acknowledge the container empty alarm.

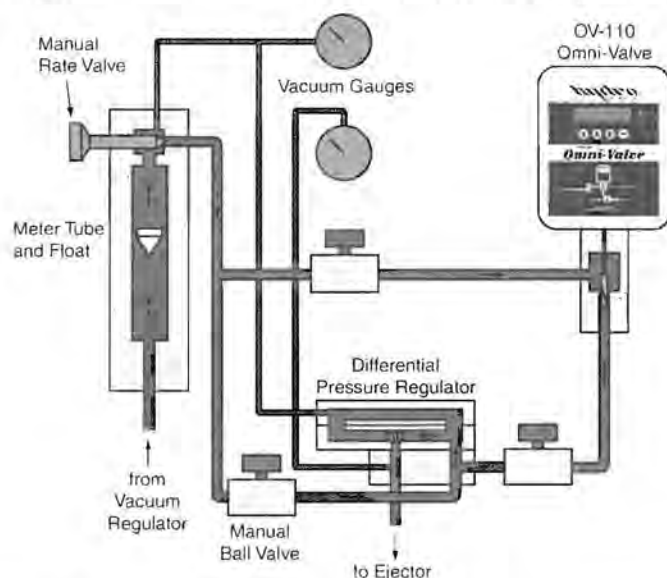
The Model CV-100 controller also can be used to manually change which ball valve is in operation and to shut down both valves simultaneously. The Model CV-100 controller records the time that each ball valve has been in the duty condition and displays the time of day, day of the week and date of the year on the screen. LEDs on the controller also indicate operation and container empty status for both sides.



Section 2 – Feed Rate Control: This section of the equipment consists of a rotameter type flow meter, manual control valve, automatic control valves and other optional equipment.

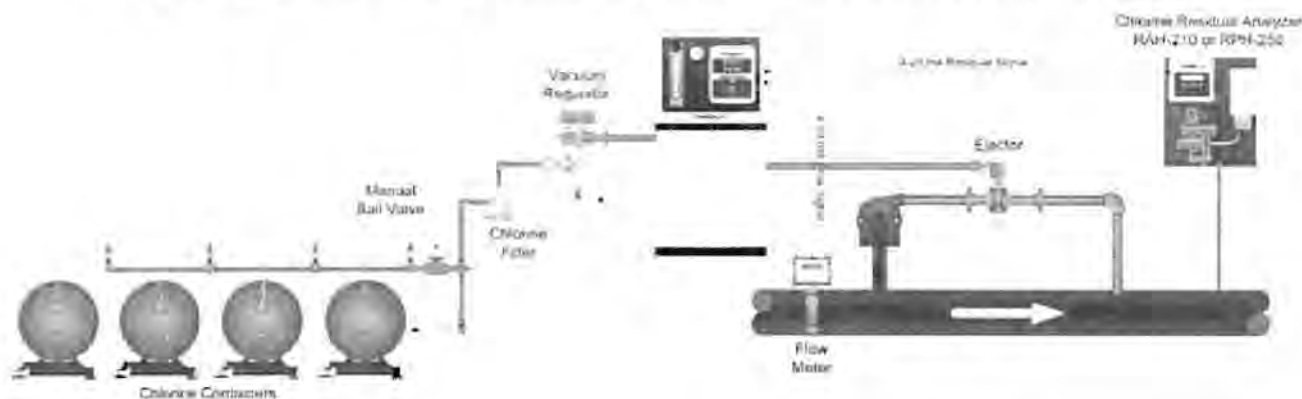
Between the vacuum regulator and the ejector, the chlorine gas flows under vacuum. A chlorine gas flow meter is installed in this section of the system to give a visual indication of the chlorine gas feed rate. Each gas chlorination system will have a manual rate control valve installed after the flow meter tube. An automatic control valve can also be installed in between the flow meter tube and the ejector. Differential pressure regulators, vacuum gauges, vacuum alarms etc. are optional.

Figure 6: Feed Rate Control Equipment



Control Type: The goal of a chlorine gas system is to inject chlorine into the water at a rate that will maintain a desired residual level in the treated process water. Therefore, as the water flow rate and the water quality change, the chlorine feed rate must also be adjusted accordingly to maintain the desired residual in the treated process water. Manual feed rate control can be used in systems where the process water flow and the water quality are both constant. If the water flow rate or water quality are variable, then it is best to use an automatic control system.

Figure 7: Automatic Control System (Compound Loop Control)





VM-150 Vacuum Monitor

The VM-150 vacuum monitor is 100% electronic, full featured monitoring system with a three digit digital readout. The system utilizes the latest in integrated sensor technology that results in improved accuracy, reliability, versatility, and chemical compatibility. All monitors come standard with an analog output for connection to local monitoring equipment.

The VM-150 comes standard with an oil based protection device that allows direct contact with many gases and liquids including chlorine and sulfur dioxide.

This unit has three alarm relays. One low alarm, one high alarm and one latch relay. All relays are general purpose NO/NC type. These relays give the end user many options on how to respond to an alarm condition.



Specifications & Features

- Input Voltage
 - 115V 60 Hz, 0.1 AMPS
 - 230V 50 Hz, 0.1 AMPS
- Alarm Relays
 - 120V @ 5 AMPS
 - 240V @ 5 AMPS
- NEMA 4X Enclosure
- 1 - 100 Second Alarm Delay
- Temperature Range: -20 - 50 C
- Three Digit LED Digital Readout
- Analog Output: 0 - 30V DC, 0 - 3.0 mA
- One Year Warranty
- Water Tight Fittings
- Three Alarm Relay Outputs:
 1. One NO/NC High
 2. One NO/NC Low
 3. One NO/NC Latch
- Independently Adjustable High/Low Trip Points
- LED Indicator for High/Low Latch Alarm
- IP65 External Latch Alarm Reset Switch

Ordering Information

Model #	Range	Low Alarm	High Alarm	Pressure	Gauge Guard
VM-150-115	0-30 in. Hg	0-15 in. Hg	15-30 in. Hg	30 PSI	Oil
VM-150-230	0-30 in. Hg	0-15 in. Hg	15-30 in. Hg	30 PSI	Oil



Series 110 Omni-Valve

The valve that does it all...

- Excellent Accuracy and Repeatability
- Maximum Versatility
- Remote adjustment and monitoring
- Gas or Liquid Metering
- Designed for Minimal Wear and Long Life

With the capability of operating in eight different control modes, handling a wide range of chemicals, covering a wide range of capacities and having a multitude of control options, adjustable features and settings, the Hydro Instruments Omni-Valve is truly an all-in-one automatic control valve for chemical feed.



Control Options (all standard)

Manual Control
Proportional (Flow) Control
Set Point (Residual) Control
Set Point (ORP) Control
Compound Loop (PID) Control
Step Feed Rate Control
Dual Input Feed Forward Control
Dual Set Point Control

*Control modes are field selectable
and can be changed at any time.*

Highlighted Features

2 x 20 Character Liquid Crystal Display
Modbus Communication (RS-485)
3 Analog Inputs
(Flow, Residual and Remote Dosage)
Adjustable: Dosage, Set Points, Lag Time,
Signal Filters, Display Ranges, Alarms & More
Linear Operation Eliminates
Rotary Drive Gears & All Rotating Motion
Broad Range of Chemicals & Capacities
Two 4-20 mA Outputs
Password Protected Settings

Because of Hydro Instruments' innovative approach to manufacturing, the **Omni-Valve** is the industry's first true directly linear drive control valve design. This linear design provides vast improvements over problematic rotary-driven valves. The **Omni-Valve** is the industry leader in terms of offering 8 different control modes (all standard) and a wealth of flexible settings and features. Our state-of-the-art microprocessor technology, highest quality materials of construction, precision machining and a minimal number of moving parts combine to make the **Omni-Valve** extremely reliable over long periods of continuous operation and truly the best automatic control valve available on the market.



OV-110 Ordering Information

Series 110 Omni-Valve

Model: OV-110 -

MAXIMUM CAPACITY

1. 500 ppd (10 kg/hr)
2. 2000 ppd (40 kg/hr)
3. 6000 ppd (120 kg/hr)

GAS OR LIQUID

- A. Ammonia (NH₃)
- B. Sodium Bisulfite (NaHSO₃)
- C. Chlorine (Cl₂)
- S. Sulfur Dioxide (SO₂)
- H. Sodium Hypochlorite (NaOCl)
- Other: Consult Factory

RANGE

- | | |
|-----------------------|--------------------------|
| 1. 10 ppd (200 gr/hr) | 7. 1000 ppd (20 kg/hr) |
| 2. 25 ppd (500 gr/hr) | 8. 2000 ppd (40 kg/hr) |
| 3. 50 ppd (1 kg/hr) | 9. 3000 ppd (60 kg/hr) |
| 4. 100 ppd (2 kg/hr) | 10. 4000 ppd (80 kg/hr) |
| 5. 250 ppd (5 kg/hr) | 11. 6000 ppd (120 kg/hr) |
| 6. 500 ppd (10 kg/hr) | |

Note: For liquid use please specify the desired max capacity.

POWER REQUIREMENTS

1. 120V 60Hz
2. 240V 50Hz

CONTROL CONFIGURATION

- | | |
|-----------------------------|----------------------------|
| 1. Flow Pacing | 5. Compound Loop (ORP) |
| 2. Residual | 6. Step Feed |
| 3. ORP | 7. Dual Input Feed Forward |
| 4. Compound Loop (Residual) | 8. Dual Set Point |

POWER CABLE LENGTH

1. 6 feet (1.5 m) standard
2. Other (consult factory)

SIGNAL CABLE LENGTH

1. 25 feet (8 m) per input channel
2. Specify length required

POWER LINE ISOLATOR

1. None (standard)
2. Included

Capacity Ranges	
Gas Feed	10, 25, 50, 100, 250, 500, 1000, 2000, 3000, 4000, & 6000 PPD
Liquid Feed	4 GPH through 10 GPM

Gas Feed	10, 25, 50, 100, 250, 500, 1000, 2000, 3000, 4000, & 6000 PPD
Liquid Feed	4 GPH through 10 GPM

hydro

INSTRUMENTS





Automatic Control Valves

Hydro Instruments offers two different automatic control valves with the below listed general specifications. The Model OV-110 offers complete Compound Loop (PID) control capabilities, while the CV-230 is more economical in price for applications that only require proportional control. Both valves use the same 10 point linearization process and automatic self calibration checking. These valves can be provided on wall panels or in floor cabinets.

CV-230

Flow Pacing Control Only	120 kg/hr maximum capacity (Cl_2)
One 4-20mA Input Channel	2 line, 20 character LCD Display
One Relay Alarm Output	Linear Stepper Motor
Two 4-20mA Output Channels	



OV-110

Flow, Residual, Compound Loop & Step Feed	Two 4-20mA Output Channels
Three 4-20mA Input Channels	120 kg/hr maximum capacity (Cl_2)
Four Relay Input Channels (step feed)	2 line, 20 character LCD Display
One Relay Alarm Output	Linear Stepper Motor



Wall Panel

Hydro Instruments offers prefabricated and tested wall panel mounted chlorine gas feed rate control panels in a variety of configurations. An example of the most common configuration with Model OV-110 Omni-Valve, bypass piping with true union ball valves, and remote meter with rate valve is shown here. Such wall panels can be provided with vacuum gauges, differential pressure regulators, high/low vacuum alarms, etc.



Floor Cabinet

Hydro Instruments offers prefabricated and tested free standing floor cabinets with a variety of optional features to choose from. Floor cabinets offer a convenient and aesthetic appearance for mounting the control and indication equipment for each chlorine gas feed point. Floor cabinets house the automatic control valve (CV-230 or OV-110), the flow meter tube and manual rate valve, and at least one vacuum gauge with diaphragm protection. Optional equipment includes a second vacuum gauge, high/low vacuum alarm, and differential pressure regulator.



Differential Pressure Regulators

Recommended for feed rates 40 kg/hr and higher
Not necessary for 10 kg/hr and below
Used for stabilizing rotameter indicator float



will install DP-500



Section 3 – Ejectors: This section creates the vacuum that operates the system and mixes the chlorine gas with the water.

High velocity water flow through the ejector venturi nozzle creates the vacuum that operates the gas chlorination system. Chlorine gas feed is stopped by stopping the water flow to the ejector. When the system is not operating and there is no water flow through the ejector nozzle, there will be no vacuum. Each ejector includes at least one check valve to prevent water from flowing back into the gas chlorination equipment when the system is turned off. Hydro Instruments manufactures a variety of different ejector designs. Refer to the nozzle performance charts and curves that can be found in the Hydro Instruments instruction manuals to consider the water flow and pressure requirements for each ejector. In general, several nozzles are available for each ejector. A list of common ejectors is given here.

EJH-142-CL2, EJH-242-CL2, EJH-542-CL2

- 10 kg/hr Maximum Capacity
- 3/4" NPT (2 kg/hr)
- 1 1/4" NPT (5 & 10 kg/hr)
- 10 kg/cm² (standard b.p.)
- 20 kg/cm² (high b.p. option)
- Check Valve without diaphragm



EJ-1000, EJ-2000, EJ-5000

- 10 kg/hr Maximum Capacity
- 3/4" NPT (2 kg/hr)
- 1 1/4" NPT (5 & 10 kg/hr)
- Double Check Valve option available
- 10 kg/cm² (standard b.p.)
- 20 kg/cm² (high b.p. option)
- Diaphragm Check Valve



EJH-2000-CL2 and EJH-3000-CL2

- 120 kg/hr Maximum Capacity
- 2" Flanged and 3" Flanged sizes
- 10 kg/cm² (maximum b.p.)
- Diaphragm Check Valve



The water exiting the ejector contains highly concentrated chlorine solution. Hydro Instruments manufactures a variety of diffusers and corporation stop assemblies that can be used to conveniently and safely inject this solution into the process stream. Secondary check valves are also available for greater protection against water backflow during system stop conditions.

Open Channel Diffusers

Provides more effective mixing in open channels and contact chambers 1/2" through 4" pipe diameter. Every unit is custom-built: pipe size, length, hole diameter, hole quantity, hole spacing and inlet connection.



Spray Diffusers and Corporation Stops

Prevents corrosion of the solution & process piping and provides better mixing in the process line. Corporation stops are designed to allow removal of the diffuser while the process pipe remains pressurized. Available in a range of sizes and materials.





Gas Leak Detectors

Hydro Instruments manufactures two series of gas leak detection equipment. Both series use the same sensors and therefore offer detection of the same set of gases. Sensors are available for Cl_2 , SO_2 , NH_3 , O_3 , ClO_2 , H_2S , CO_2 , H_2 , O_2 , NO , NO_2 , & HCl . The general specifications are shown here below.

GA-170

- 1 to 4 sensors per monitor
- 2 line, 16 character display
- Integral 90 dB audible alarm
- Optional battery backup
- 6 adjustable relay outputs
- 2 LED indicators per sensor
- RS-232 and 4-20mA outputs



GA-171

- 1 to 2 sensors per monitor
- 2 line, 16 character display
- 1 adjustable common relay output
- 2 LED indicators per sensor
- RS-232 and 4-20mA outputs



Residual Analyzers

Hydro Instruments produces two series of residual analyzers for online measurement. Both instruments utilize the amperometric method of measurement. The Series RAH-210 incorporates an open flow cell design with large electrode surface area and continuous motor driven cleaning for rugged operation. The Series RPH-250 incorporates a semipermeable membrane and electrolyte design.

RAH-210

- Free Chlorine, Total Chlorine, & ClO_2
- Continuous Self Cleaning
- PID controller included
- One 4-20mA input channel
- Two 4-20mA output channels
- One alarm relay output
- 2 line, 20 character display
- 2 LED indicators
- RS-232 output
- Temperature Sensor
- Optional pH probe
- Optional Buffer Chemical Feed Systems
- Optional pH Compensation in software



RPH-250

- Free Chlorine & ClO_2
- PID controller included
- One 4-20mA input channel
- Two 4-20mA output channels
- One alarm relay output
- 2 line, 20 character display
- 2 LED indicators
- RS-232 output
- Temperature Sensor
- Optional pH probe
- Optional pH Compensation in software





Additional Gas Chlorination Equipment

Chlorine Service Ball Valves

Manual and electronic with a range of connection sizes. Teflon seals and Carbon Steel housings. Optional Monel or Hastelloy C ball and stem.



Isolation Valve Assemblies

Eliminate the stress on flexible connectors during cylinder changes. Increase the safety and convenience of changing chlorine containers.



Vacuum Monitor

Continuously monitor the chlorine gas vacuum level with digital display. Adjustable high and low alarm relays. Specifically designed for chlorine gas application.



Chlorine Container Scales

Used for monitoring and recording chlorine supply and usage. Electronic and hydraulic scales are available from Hydro Instruments in a variety of configurations. Scale sets are available for weighing the contents of one, two or more chlorine containers simultaneously.



Pressure Reducing Valve

The Hydro Instruments Series PRV-71H Pressure Reducing Valve is used to reduce and control the gas pressure downstream of the valve. The PRV-71H is designed for chlorine or sulfur dioxide gas service.



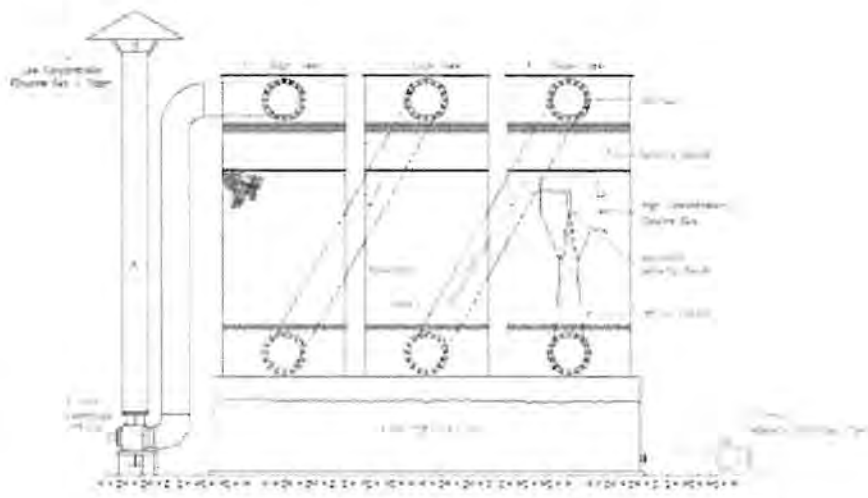


Chlorine Leak Absorption Systems

The chlorine scrubber system operation is activated by an alarm relay signal from a gas leak detector. Chlorine storage room air is drawn into the scrubber system where the chlorine is chemically extracted before exhausting the cleaned air to the outside environment. Chlorine scrubber systems are available from Hydro Instruments and our sales representatives in a variety of configurations and sizes.



SINGLE STAGE SCRUBBER



3 STAGE SCRUBBER

Emergency Shut-Off Systems

These systems are activated by an alarm relay signal from a gas leak detector. A valve closure actuator (shut-off device) is mounted directly on the chlorine container valve. In the event of a leak, the device will close all of the chlorine container valves immediately to stop the leak. Emergency shut-off systems are available from Hydro Instruments and our sales representatives in a variety of configurations and sizes.



**Contact us:**

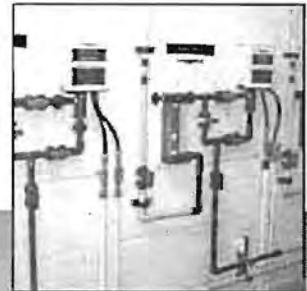
Hydro Instruments
600 Emlen Way
P.O. Box 387
Telford, PA 18969 USA
TEL: 215-799-0980
FAX: 215-799-0984
Website: <http://www.hydroinstruments.com/>

**USA & Canada**

E-mail: sales@hydroinstruments.com

International Sales

E-mail: intsales@hydroinstruments.com

**Represented by:**



Wall Panel Series Panel Mounted Products

Wall Panel Series

The Wall Panel Series offers the ability to panel mount the OV-110 and CV-230 automatic feed rate control valves offered by Hydro Instruments.

- Wall panel mounting simplifies the installation process providing easy access to the equipment for operation and maintenance. Panel mounting minimizes the equipments footprint which conserves space and eliminates the use of cabinets.
- Every panel is constructed from the highest quality "high density polyethylene" plastic and schedule 80 PVC piping. Panels are available in standard sizing for the most common configurations. Custom panels are also available. The bypass piping and valve arrangements allows for simple manual feed control whenever maintenance or calibrations are needed on the control valve.



OV-110 Control Options (all standard)

- Manual Control
- Proportional (Flow) Control
- Set Point (Residual) Control
- Set Point (ORP) Control
- Compound Loop (PID) Control
- Step Feed Rate Control
- Dual Input Feed Forward
- Dual Set Point Control

Control modes are field selectable and can be changed at any time.

OV-110 Highlighted Features

- 2 x 20 Character Liquid Crystal Display
- Modbus Communication (RS-485)
- 3 Analog Inputs (Flow, Residual and Remote Dosage)
- Adjustable: Dosage, Set Points, Lag Time, Signal Filters, Display Ranges, Alarms & More
- Linear Operation Eliminates Rotary Drive Gears & All Rotating Motion
- Broad Range of Chemicals & Capacities
- Two 4-20 mA Outputs
- Password Protected Settings
- External control of: Duty/Standby & Auto/Manual



Custom Configurations and Options

Wall Panel Series 110 Omni-Valve Order Information

Model: WPOV-110 -

A B C D E F G H I J K

Position	Feature	Description
A. MAXIMUM CAPACITY	1	500 ppd (10 kg/hr):
	2	2000 ppd (40 kg/hr):
	3	6000 ppd (120 kg/hr):
B. GAS OR LIQUID	A	Ammonia (NH ₃)
	B	Sodium Bisulfite (NaHSO ₃)
	C	Chlorine (Cl ₂)
	S	Sulfur Dioxide (SO ₂)
	H	Sodium Hypochlorite (NaOCl)
	Other	Consult Factory
C. FLOW METER CAPACITY <i>Note: For liquid use please specify the desired max capacity.</i>	1	10 ppd (200 gr/hr)
	2	25 ppd (500 gr/hr)
	3	50 ppd (1 kg/hr)
	4	100 ppd (2 kg/hr)
	5	250 ppd (5 kg/hr)
	6	500 PPD (10 kg/hr)
	6A	500 PPD (10 kg/hr) RM-702 <i>RM-702 Rate Valve Knob protrudes from front of meter</i>
	7	1000 ppd (20 kg/hr)
	8	2000 ppd (40 kg/hr)
	9	3000 ppd (60 kg/hr)
	10	4000 ppd (80 kg/hr)
	11	6000 ppd (120 kg/hr)
D. POWER REQUIREMENTS	1	120V 60Hz
	2	240V 50Hz
E. CONTROL CONFIGURATION	1	Flow Pacing
	2	Residual
	3	ORP
	4	Compound Loop (Residual)
	5	Compound Loop (ORP)
	6	Step Feed
	7	Dual Input Feed Forward
	8	Dual Set Point
F. POWER CABLE LENGTH	1	6 feet (1.5 m) standard
	2	Other (consult factory)
G. SIGNAL CABLE LENGTH	1	25 feet (8 m) per input channel
	2	Specify length required
H. 4-20 mA OUTPUT	1	Not Included
	2	Included
I. POWER LINE ISOLATOR	1	None (standard)
	2	Included
J. BYPASS PIPING ARRANGEMENT	1	None
	2	Up to 500 ppd (10 kg/hr)
	3	2000 ppd (40 kg/hr)
	4	3000 ppd (60 kg/hr)
	5	6000 ppd (80 kg/hr)
K. DIFFERENTIAL PRESSURE REGULATOR	1	None
	2	Up to 250 ppd (5 kg/hr)
	3	500 ppd (10 kg/hr)
	4	2000 ppd (40 kg/hr)
	5	3000 ppd (60 kg/hr)
	6	4000 ppd (80 kg/hr)
	7	6000 ppd (120 kg/hr)

NOTES:

- Standard flow tubes for up to 250 PPD (5 kg/hr) are 3" length. For 6" flow tubes on Item C=1-5, add an "A" after this number (i.e., 3 becomes 3A).
- Port sizes are as follows:
 - up to 250 PPD (5 kg/hr) has 1/4" NPT
 - 500 PPD (10 kg/hr) has 1/2" NPT
 - 1000 & 2000 PPD (20 & 40 kg/hr) has 1" NPT
 - 3000, 4000, & 6000 PPD (60, 80, & 120 kg/hr) has 1.5" Socket

hydro INSTRUMENTS



OZONE CALCULATIONS

Flint WTP

OXYGEN AND NITROGEN SYSTEMS CAPACITIES**DATA LEGEND**

REQUIRED DATA

FIXED DATA - DO NOT CHANGE UNLESS EQUIPMENT IS REPLACED

DATA SHOULD NOT CHANGE (MAY BE TWEAKED BASED ON OPERATIONAL RESULTS)

CALCULATION RESULTS

LOX SYSTEM (AVG DAY - AVG DOSE)

PRESSURE RATING (psig)	175
OPERATING WT (lbs)	119,600
TARE WT (lbs)	33,000
EFFECTIVE VOLUME (lbs)	86,600
EFFECTIVE VOLUME (gals)	9,084
OXYGEN USAGE (ppd)	2833
OXYGEN GAS FLOW (scfm)	23.8
EFFECTIVE STORAGE (days)	30.6

LN SYSTEM (AVG DAY - AVG DOSE)

PRESSURE RATING (psig)	250
OPERATING WT (lbs)	7,100
TARE WT (lbs)	3,800
EFFECTIVE VOLUME (lbs)	3,300
EFFECTIVE VOLUME (gals)	540
NITROGEN USAGE (ppd)	71
NITROGEN GAS FLOW (scfm)	0.7
EFFECTIVE STORAGE (days)	46.6

OPERATING CONDITIONS (AVG DAY)

WATER PLANT FLOW (MGD)	10
OZONE DOSE (mg/l)	2.5
OZONE CONCENTRATION (%)	8
TRANSFER EFFICIENCY (%)	92
OZONE FEED RATE (ppd)	227

OPERATING CONDITIONS (MAX DAY)

WATER PLANT FLOW (MGD)	18
OZONE DOSE (mg/l)	4
OZONE CONCENTRATION (%)	8
TRANSFER EFFICIENCY (%)	92
OZONE FEED RATE (ppd)	653

STORAGE REQUIREMENTS

DAYS @ AVG DAY - AVG DOSE	30	
LIQUID OXYGEN (lbs)	84986	
LIQUID NITROGEN (lbs)	2125	
NUMBER OF LOX TANKS	0.98	Use 1
NUMBER OF LN TANKS	0.64	Use 1

SUMMARY OF RESULTS

Based on Average Day Demand of 10 MGD and Average Dosage of 2.5 mg/L ozone at 8% concentration, a single 9,084 gallon LOX tank and a single 540 gallon LIN tank will provide the 30 days of storage. Two LOX tanks and two LIN tanks are provided for redundancy.

LOX Avg Day Flow Ppd; $2.5 \text{ mg/L} \times 10 \times 8.34 = 208.5 \text{ PPD} \times \frac{100 \text{ lbs O}_3 \text{ wsp}}{8 \text{ lbs LOX}} \times \frac{100}{92} = 2833 \text{ lbs O}_2 / \text{DAY} = 30.5 \text{ DAYS}$

REF WTP-BOD max DAY; $4.5 \times 18 \times 8.34 \times \frac{100}{8} \times \frac{100}{92} = 8159 \text{ LBS/DAY}$

LN $\rightarrow$ Avg Day $2.5 \times 10 \times 8.34 = 208.5 \text{ PPD} \times \frac{100 \text{ lbs O}_2 \text{ wsp}}{8 \text{ lbs LN}} \times \frac{100}{92} = 2833 \text{ lbs O}_2 / \text{DAY} = 30.5 \text{ DAYS}$

LN $\rightarrow 2833 \times 0.025 = 71 \text{ PPD LN} \rightarrow 46.6 \text{ DAYS}$

2 Mgd $\rightarrow 852 \text{ PPD} \rightarrow 39 \text{ DAYS}$

12 MGD $\rightarrow 3400 \text{ LBS/DAY}$
 CR 25 DAYS

12 MGD $\rightarrow 5440 \text{ LBS/DAY}$
 CR 18 DAYS

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS (CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN *Required under the Authority of 1976 PA 399, as amended*

ENTERED

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Environmental Quality (DEQ) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint 4500 N. Dort Highway Flint, MI 48505 WSSN: 02310	Permit Stamp Area (DEQ use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 151055 JUL 14 2015 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976	
2. Owner's Contact Person (provide name for questions): Contact: Brent Wright Title: Water Plant Supervisor Phone: 810.787.6537		
3. Project Name (Provide phase number if project is segmented): Flint WTP Phase II, Segment 3 Filter Media Replacement	4. Project Location (City, Village, Township): Flint, MI	5. County (location of project): Genesee

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY

cc:

DEQ
RESOURCE MANAGEMENT DIVISION

JUN 30 2015

LANSING DISTRICT

Issued by:

Michael Pappalardo

Reviewed by:

Michael Pappalardo

☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DEQ District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions **will be returned**. SEE EXAMPLES BELOW. Use additional sheets if needed.

Replace media of 12 dual media filters, new media to be 12" sand and 18" Granular Activated Carbon. Relocate chlorine feed point to the weir chamber, immediately downstream of the filters. Chlorine to be fed into a pipe leaving bay 1 and outletting into bay 2 of the weir chamber.

Project also included addition of a water tight hatch, retrofitted into existing access port in the roof of the weir chamber which is in the office level floor. A chlorine gas detector will be installed with the monitor panel viewable at the hatch. Two additional closed ports will be installed into the weir chamber walls to allow for hook up of exhausting equipment in case chlorine vapor ever needs to be expelled to enter the chamber.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address:

Jeff Hansen, PE
Lockwood, Andrews and Newnam, Inc.
1311 South Linden Rd, Suite B
Flint, MI 48532

8. Indicate who will provide project construction inspection:

- ☐ Organization listed in Box 1.
☒ Engineering firm listed in Box 7.
☐ Other - name, address, and phone number listed below.

9. Is a basis of design attached?

☒ YES ☐ NO

If no, briefly explain why a basis of design is not needed.

10. Are sealed and signed engineering plans attached?

☒ YES ☐ NO

If no, briefly explain why engineering plans are not needed.

11. Are sealed and signed construction specifications attached?

☒ YES ☐ NO

If specifications are not attached, they need to be on file at DEQ.

12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed?

☒ YES ☐ NO

If no, explain which deviations were made and why.

13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved?

☒ YES ☐ NO

If no, describe what coatings, additives or materials did not meet the applicable standard and why.

14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement?

(For projects not located in the public right-of-way, utility easements must be shown on the plans.)

☒ YES ☐ NO

If no, explain how access will be obtained.

15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451?

☐ YES ☒ NO

If yes, a wetland permit must be obtained.

16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules?

☐ YES ☒ NO

If yes, a flood plain permit must be obtained.

17. Is the project construction activity within 500 feet of a lake, reservoir, or stream?

☐ YES ☒ NO

If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?

☐ YES ☒ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☒ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES ☒ NO

If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) _____

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☐ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DEQ.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, BRENT F. WRIGHT (name), acting as the SUPERVISOR (title/position) for

CITY OF FLINT WATER PLANT (entity owning proposed facilities) certify that this project has

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.

Brent F. Wright
Signature*

6/30/15
Date

(810) 787-6537
Phone

*Original signature only, no photocopies will be accepted.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

PROJECT BASIS OF DESIGN – FOR WATER MAIN PROJECTS

PROJECT NAME: Flint WTP Phase II, Segment 3 Filter Media Replacement

For this PROJECT the following information must be provided per Act 399 unless waived by the Department. For projects other than water main installation, or if additional space is needed, attach separate sheet(s) with detailed Basis of Design calculations.

- A. A general map of the initial and ultimate service areas
☒ Included on engineering plans ☐ Attached separately
- B. Number of service connections served by this permit application see basis of design
- C. Total number of service connections ultimately served by entire project _____
- D. Residential Equivalent Units (REUs) served by this permit application _____
- E. Total Residential Equivalent Units (REUs) ultimately served by entire project _____
- F. Water flow rates for proposed project based on REUs listed in "D" and "E" above
- | | |
|--|---------------------------|
| 1. Initial design average day flow (mgd) | <u>18.3</u> |
| 2. Initial design maximum day flow (mgd) | <u>25.4</u> |
| 3. Total design average day flow (mgd) | <u>24.0</u> |
| 4. Total design maximum day flow (mgd) | <u>30.0</u> |
| 5. Required fire flows: ⁽¹⁾ | _____ gpm for _____ hours |
- G. Actual flows and pressures of existing system at the connection point(s) ⁽²⁾
- | |
|------------------------|
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
| _____ gpm at _____ psi |
- H. Estimated minimum flows and pressures within the proposed water main system ⁽³⁾
- | |
|------------------------|
| _____ gpm at _____ psi |
|------------------------|

(1) Every water system must decide what levels of fire fighting flows they wish to provide. Fire flow should be appropriate for the area (residential, commercial, industrial) being served by the project. Typical fire flow rates can be obtained from the water supply, local fire dept., ISO or AWWA. The water system must then be designed to be able to provide the required fire flows while maintaining at least 20 psi in all portions of the distribution system.

(2) Flows and pressures at the connection points must be given to determine if the existing water main(s) are able to deliver water to the new service area. These numbers can be obtained from a properly modeled and calibrated distribution system hydraulic analysis or hydrant flow tests performed in the field. If more than one connection is proposed, list as needed.

(3) List what the estimated minimum flows can be expected in the proposed water mains based on estimated water demands, head losses, elevation changes and other factors that may affect flows, such as dead end mains.

CONTRACT DOCUMENTS AND SPECIFICATIONS
FOR
CITY OF FLINT WATER TREATMENT PLANT
PHASE II, SEGMENT 3 – FILTER MEDIA REPLACEMENT
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DIVISION 3 CONCRETE

DIVISION 5 METALS

SECTION 05550 BOLTS, ANCHOR BOLTS AND EXPANSION ANCHORS

DIVISION 9 FINISHES

SECTION 09928 PROTECTIVE COATING SYSTEMS

DIVISION 11 EQUIPMENT

DIVISION 13 SPECIAL CONSTRUCTION

DIVISION 15 MECHANICAL

DIVISION 16 ELECTRICAL

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W. 151055 JUL 14 2013

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1978

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 ***

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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
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**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
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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
 - J. 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 proved 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 Devoe 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 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 IP1	TF1 or IPF1
Steel-Structural Tanks, Pipes, Equipment Interior, Non-Immersion	SSPC-SP6	TP2 or IPP1	TI2 or IP1	TF4 or IPF2
Steel-Structural Tanks, Pipes, Equipment Interior, Non-Immersion (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 IP3	TF1 or IPF1
Factory Primed Steel Interior Exposed	N/A	N/A	TI4 or IP3	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 IP13	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 IP11	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 IP11	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 IP15	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	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

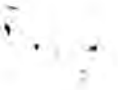
J. International Paint Finish (IPF) Coats:

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



CITY OF FLINT WTP Filter Media Replacement Basis of Design

ULTRASORB
400

Notes

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

Area / Filter = 700 sft
Number of Filters = 12

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

Top of Underdrain elev =	723.58	
Washwater Trough Weir elev =	730.67	
Operating Water Level =	734.00	
Top of Filter Basin / Floor elev =	736.00	
Filter BW Dimensional D =	7.08	
Existing Sand D =	12.00 inches =	1.00 ft
Existing Anthracite D =	18.00 inches =	1.50 ft
Proposed Sand D =	12.00 inches =	1.00 ft
Proposed GAC D =	18.00 inches =	1.50 ft
Proposed Water Depth =		7.92 ft
Max Cold BW Flow rate / filter =	9800 gpm =	14.0 gpm/sft
Max Warm BW Flow rate / filter =	14000 gpm =	20.0 gpm/sft
Max Sand Expanded D =	14.2 inches =	1.18 ft
Max GAC Expanded D =	34.20 inches =	2.85 ft
Total BW Expanded D =	48.40 inches =	4.03 ft
Proposed BW Freeboard =		3.05 ft
Proposed # of Filters to Replace	12	
GAC Volume =	12,600 cft	
GAC apparent density =	33.7 lbs/cft	
GAC Total Weight =	424,620 lbs =	212.3 tons

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

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

	mgd	30.0	24.0	8.0
Contact time (min) =		55.0	68.8	206.3
CT =		99.0	123.8	371.4

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

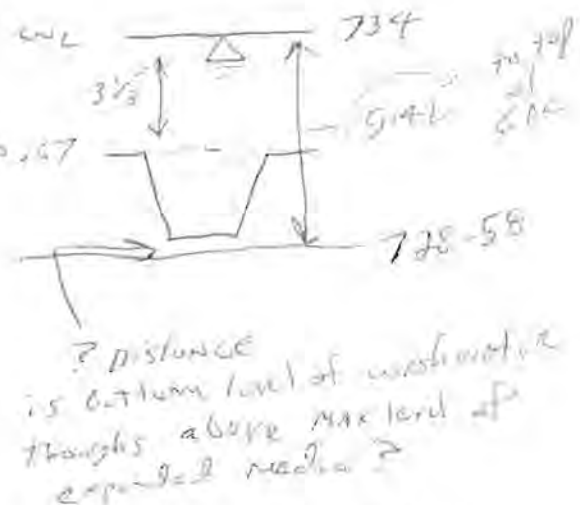
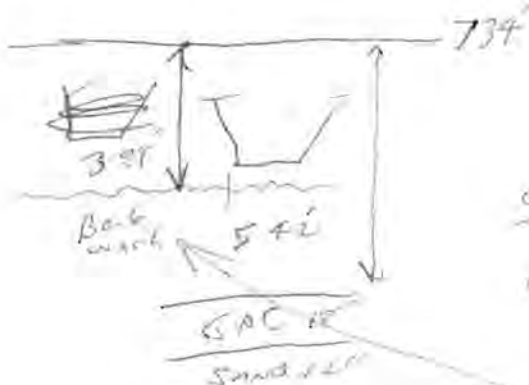
7.92 Current Depth

New Depth
7.92
- 2.50 ft
5.42 ft

See following pages for details

To match current BW flow rate
Use when water temp > 65 degrees
Occurs at cold temps

Calculations attached separately



Lockwood, Andrews
& Newnam, Inc.
A FLO & DAILY COMPANY

After conf. w. Mike & Brent
WTP average

OK

M. GARR - Utilities Administrator

CITY OF FLINT- DEPARTMENT OF PUBLIC UTILITIES

GAC Filter Evaluation

Filter Media Analysis

2015 1st Stage

Date: 05/20/15

By: JRH

Data Entry:

WATER INPUT DATA

Backwash Rate (gpm/sf)	14.0
Water Temperature (F°)	32
Viscosity (centipoise)	1.79355
Dynamic Viscosity (#-sec/sf)	3.746E-05
Water Density (#/cf)	62.42
Mass Density (#-sec/ft ⁴)	1.940

COMMENTS

Uniformity Coeff - a 6.7 high in the
Filtrisorb Product & Effective Size

SITE LOCATION	10 States		10 States Interpreted		Filtrisorb 400		Filtrisorb 300		Alt	
Media Type	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC
Bed Depth (in)	12	18	12	18	12	18	12	18	12	18
Uniformity Coefficient	2.30	1.65✓	2.30	1.40✓	2.30	1.90*	2.30	2.10*	2.30	1.50✓
Effective Size (mm)	0.400	0.550✓	0.40	0.800*	0.40	0.650*	0.40	0.800*	0.40	0.650*
d60% Size (mm)	0.920	0.908	0.920	1.120	0.920	1.235	0.920	1.680	0.920	0.975
d90% Size (mm)	1.607	1.269	1.607	1.403	1.607	1.899	1.607	2.762	1.607	1.279
Porosity	0.40	0.50	0.40	0.50	0.40	0.50	0.40	0.50	0.40	0.50
Specific Gravity	2.554	1.45	2.554	1.45	2.554	1.45	2.554	1.45	2.554	1.45
Media Density (#/cf)	159.4	90.5	159.4	90.5	159.4	90.5	159.4	90.5	159.4	90.5
Min. Fluidization Rate (gpm/sf)	7.03	2.14	7.03	3.13	7.03	3.74	7.03	6.55	7.03	2.43
Reynolds Number	2.447	0.734	2.447	1.329	2.447	1.750	2.447	4.168	2.447	0.899
Correction Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Min. Fluidization Rate (gpm/sf)	7.03	2.14	7.03	3.13	7.03	3.74	7.03	6.55	7.03	2.43
Unhindered Settling Vel. (ft/sec)	20.68	6.20	20.68	11.23	20.68	14.79	20.68	35.22	20.68	7.59
Expansion Coefficient (n)	3.287	3.708	3.287	3.494	3.287	3.399	3.287	3.117	3.287	3.633
Bed Porosity Coefficient (k)	142.82	27.92	142.82	35.31	142.82	39.49	142.82	56.85	142.82	30.22
Porosity (expanded)	0.493	0.830	0.493	0.767	0.493	0.737	0.493	0.638	0.493	0.809
Bed Depth Expanded (in)	14.2	53.0	14.2	38.7	14.2	34.2	14.2	24.9	14.2	47.2
% Expanded Bed	18.4	194.4	18.4	115.0	18.4	90.1	18.4	38.1	18.4	162.0
d90gac/d10s Ratio	3.173		3.508		4.746		6.905		3.198	
Discussion/Notes										



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

CITY OF FLINT- DEPARTMENT OF PUBLIC UTILITIES

GAC Filter Evaluation

Filter Media Analysis

2015 1st Stage

Date: 05/20/15

By: JRH

Data Entry:

WATER INPUT DATA	
Backwash Rate (gpm/sf)	20.0
Water Temperature (F°)	80
Viscosity (centipoise)	0.86134
Dynamic Viscosity (# -sec/sf)	1.799E-05
Water Density (#/cf)	62.22
Mass Density (# -sec/ft ⁴)	1.927

COMMENTS

SITE LOCATION	10 States		10 States Interpreted		Filtrisorb 400		Filtrisorb 300		Alt	
Media Type	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC
Bed Depth (in)	12	18	12	18	12	18	12	18	12	18
Uniformity Coefficient	2.30	1.65	2.30	1.40	2.30	1.90	2.30	2.10	2.30	1.50
Effective Size (mm)	0.400	0.550	0.400	0.800	0.400	0.650	0.400	0.800	0.400	0.650
d60% Size (mm)	0.920	0.908	0.920	1.120	0.920	1.235	0.920	1.680	0.920	0.975
d90% Size (mm)	1.607	1.269	1.607	1.403	1.607	1.899	1.607	2.762	1.607	1.279
Porosity	0.40	0.50	0.40	0.50	0.40	0.50	0.40	0.50	0.40	0.50
Specific Gravity	2.554	1.45	2.554	1.45	2.554	1.45	2.554	1.45	2.554	1.45
Media Density (#/cf)	159.4	90.5	159.4	90.5	159.4	90.5	159.4	90.5	159.4	90.5
Min. Fluidization Rate (gpm/sf)	13.38	4.09	13.38	6.00	13.38	7.16	13.38	12.54	13.38	4.66
Reynolds Number	9.640	2.905	9.640	5.259	9.640	6.928	9.640	16.499	9.640	3.557
Correction Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.828	1.000	1.000
Min. Fluidization Rate (gpm/sf)	13.38	4.09	13.38	6.00	13.38	7.16	13.38	10.39	13.38	4.66
Unhindered Settling Vel. (ft/sec)	81.46	24.55	81.46	44.44	81.46	58.54	81.46	139.42	81.46	30.06
Expansion Coefficient (n)	2.866	3.231	2.866	3.045	2.866	2.962	2.866	2.716	2.866	3.166
Bed Porosity Coefficient (k)	184.94	38.40	184.94	49.50	184.94	55.84	184.94	68.25	184.94	41.83
Porosity (expanded)	0.460	0.817	0.460	0.743	0.460	0.707	0.460	0.636	0.460	0.792
Bed Depth Expanded (in)	13.3	49.2	13.3	35.0	13.3	30.7	13.3	24.8	13.3	43.3
% Expanded Bed	11.2	173.5	11.2	94.3	11.2	70.7	11.2	37.5	11.2	140.5
d90gac/d10s Ratio	3.173		3.508		4.746		6.905		3.198	
Discussion/Notes										



Lockwood, Andrews
& Newnam, Inc.
A LEAD-ADLY COMPANY

2.71 MGAL
200 ft

2.78 MGAL

CT CALCS																						
TIME FROM FILTERS EFFLUENT TO 1ST TAP																						
Label	Location	Diameter		L ft	W ft	D ft	Bottom elev	Vol cft	Flow Rate		Baffle Factor	Time min	Velocity fps	Flow Rate		Time min	Flow Rate		Time min			
		in	ft						mgd	cft/s				mgd	cft/s		mgd	cft/s				
A	Weir chamber, pre-baffle			26.75	13.08	15.5	709.00	5423	30.0	46.4	1.0	1.95	0.23	24.0	37.1	2.43	8.0	12.4	7.30			
B	Weir chamber, post-baffle			26.75	8.5	10.0	709.00	2274	30.0	46.4	1.0	0.82	0.55	24.0	37.1	1.02	8.0	12.4	3.06			
Effluent pipe																						
C	wc - bldg face	48	4.00	16.00				201	30.0	46.4	1.0	0.07	3.69	24.0	37.1	0.09	8.0	12.4	0.27			
D	bldg face - junct well	48	4.00	401.00				5039	30.0	46.4	1.0	1.81	3.69	24.0	37.1	2.26	8.0	12.4	6.79			
Res. 3																						
E	Junct well			12.00	18.00	15.0	704.00	3240	30.0	46.4	1.0	1.16	0.17	24.0	37.1	1.45	8.0	12.4	4.36			
F	Clear well			140.00	177	10.0	709.00	247,800	30.0	46.4	0.5	44.49	0.05	24.0	37.1	55.61	8.0	12.4	166.83			
G	Transfer chamber			7.00	55.25	15.0	704.00	5,801	30.0	46.4	1.0	2.08	0.06	24.0	37.1	2.60	8.0	12.4	7.81			
H	Suction well			9.00	25.75	15.0	704.00	3,476	30.0	46.4	1.0	1.25	0.12	24.0	37.1	1.56	8.0	12.4	4.68			
Pump																						
I	Suction pipe	36	3.00	12.00				85	30.0	46.4	1.0	0.03	6.57	24.0	37.1	0.04	8.0	12.4	0.11			
J	Discharge pipe	30	2.50	20.00				98	30.0	46.4	1.0	0.04	9.46	24.0	37.1	0.04	8.0	12.4	0.13			
K	Dis. pipe (to bldg face)	42	3.50	34.00				327	30.0	46.4	1.0	0.12	4.82	24.0	37.1	0.15	8.0	12.4	0.44			
Finish main 1																						
L1	bldg face - 1st tee	42	3.50	208.00				2001	30.0	46.4	1.0	0.72	4.82	24.0	37.1	0.90	8.0	12.4	2.69			
M1	tee - WTP tap	42	3.50	223.00				2146	30.0	46.4	1.0	0.77	4.82	24.0	37.1	0.96	8.0	12.4	2.89			
N1	WTP tap - bldg face	12	1.00	19.00				15	30.0	46.4	1.0	0.005	59.10	24.0	37.1	0.01	8.0	12.4	0.02			
Subtotal									1.49				1.87				5.60					
Finish main 2																						
L2	bldg face - 1st tee	42	3.50	73.00				702	30.0	46.4	1.0	0.25	4.82	24.0	37.1	0.32	8.0	12.4	0.95			
M2	tee - 1st split	42	3.50	277.00				2665	30.0	46.4	1.0	0.96	4.82	24.0	37.1	1.20	8.0	12.4	3.59			
Subtotal									1.21				1.51				4.53					
									Total CT time @ 36 mgd =				55.0		@ 24 mgd =		68.8		@ 12 mgd =		206.3	
2014																						
Month		May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Min		Avg		Max				
Cl2		5.0	4.7	3.9	3.3	3.1	2.5	2.0	1.8	1.8	2.1	2.4	2.0	1.8		2.9		5.0				
pH		7.37	7.48	7.62	7.78	7.82	7.71	7.87	8.07	7.74	7.84	7.89	7.83	7.4		7.8		8.1				
Flow (mgd)		30.0	24.0	8.0																		
CT =		99.0	123.6	371.4																		

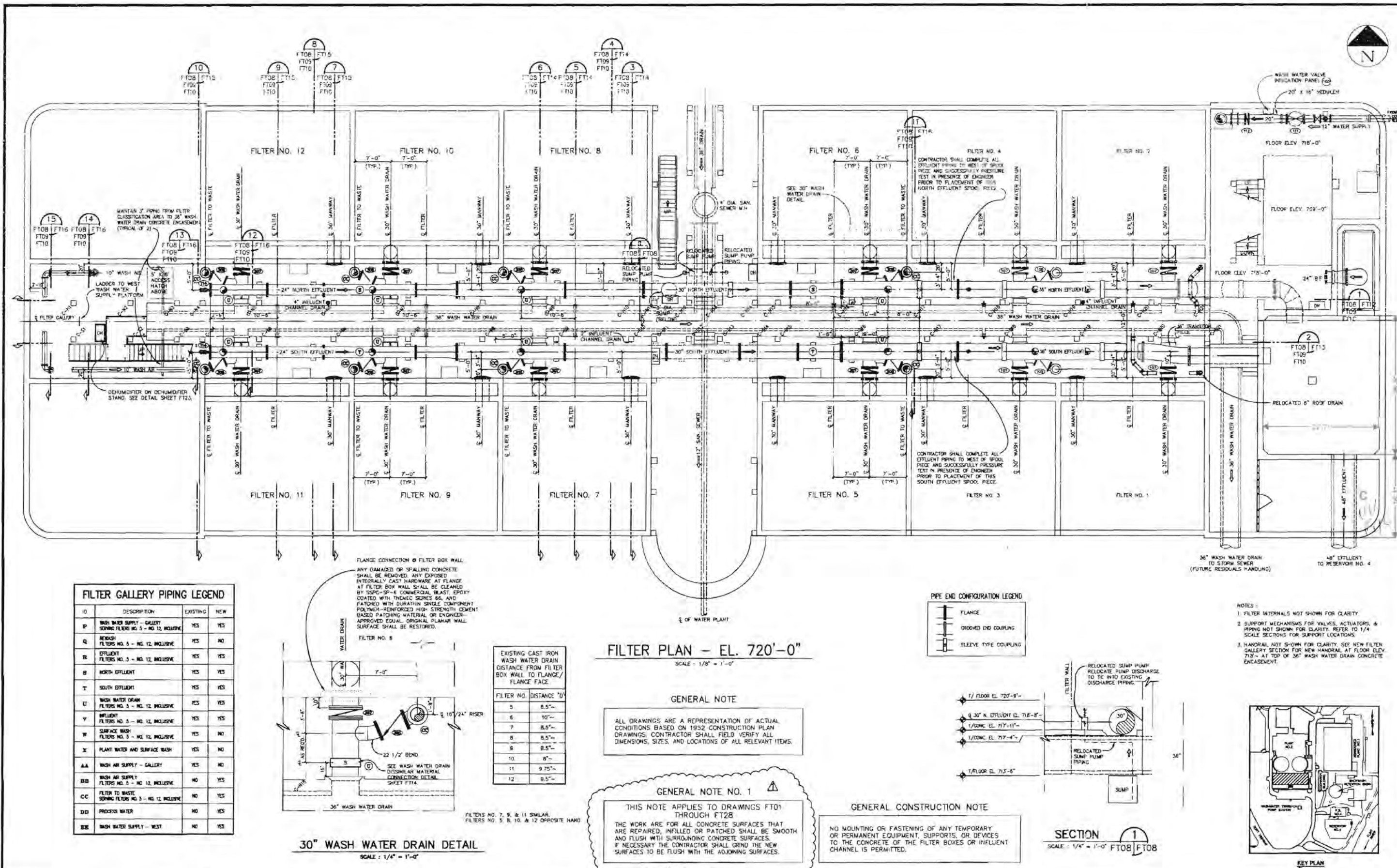


Table C-1. CT Values for Inactivation of *Giardia* Cysts by Free Chlorine at 0.5°C or Lower

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

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

Source: AWWA, 1991.



THE **CDLZ** TEAM

FLINT MICHIGAN
CITY OF FLINT
DEPARTMENT OF PUBLIC WORKS & UTILITIES

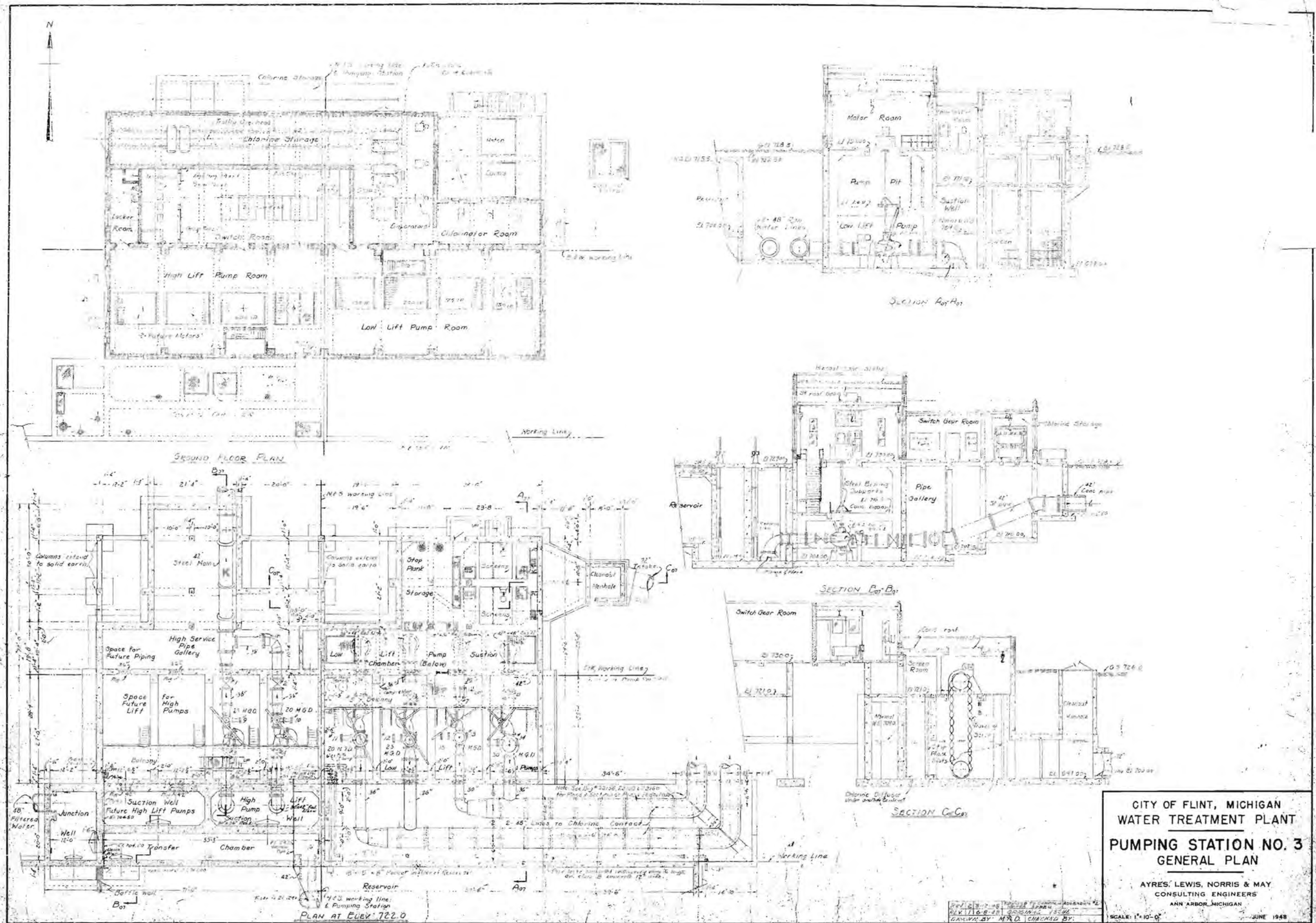
WATER TREATMENT PLANT REHABILITATION PHASE I, SEGMENT 4

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

DRAWN	J.E.P.	NO.	REVISION	BY	DATE
CHK'D	C.A.P.	1	ADDENDUM NO. 1 REVISION	J.O.	10/03
APPRO'D	C.A.P.	AS-BUILT		D.J.V.	8/05
DATE	JUNE 2002				
PROJECT NUMBER	7019-04				

SHEET
OF
DRAWING NUMBER
FT08





PARTIAL SECTIONAL PLAN @ E.I. 711.2
(Showing High & Low Lift Piping)
Scale 1/4" = 1'-0"

6 Pumping Station
(North-South working line)

NOTE:

1. Copy of Plan in Pump Station
2. Copy of Plan in High Lift Pumping Station
3. Copy of Plan in Low Lift Pumping Station
4. Copy of Plan in High Lift Pumping Station
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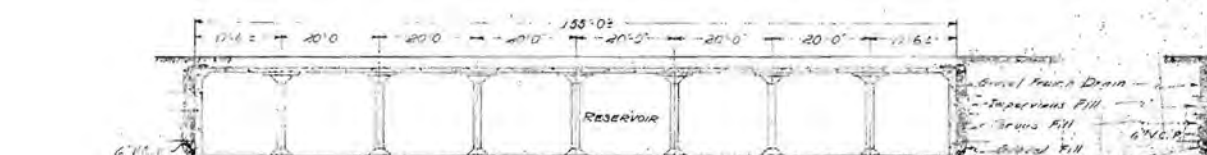
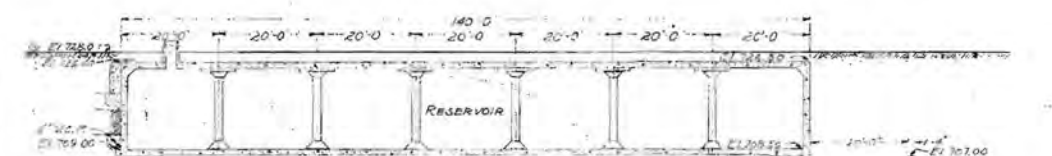
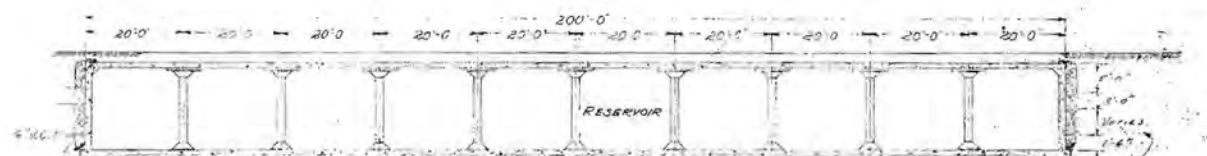
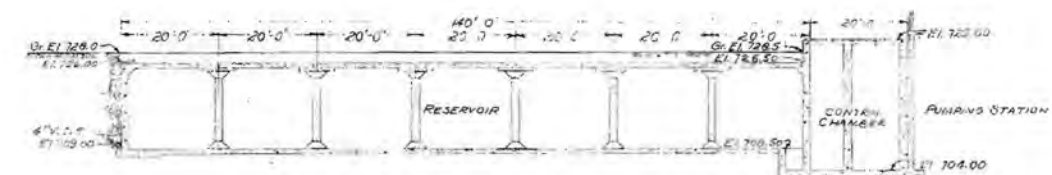
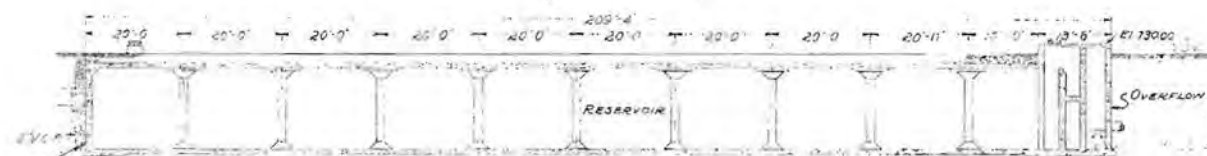
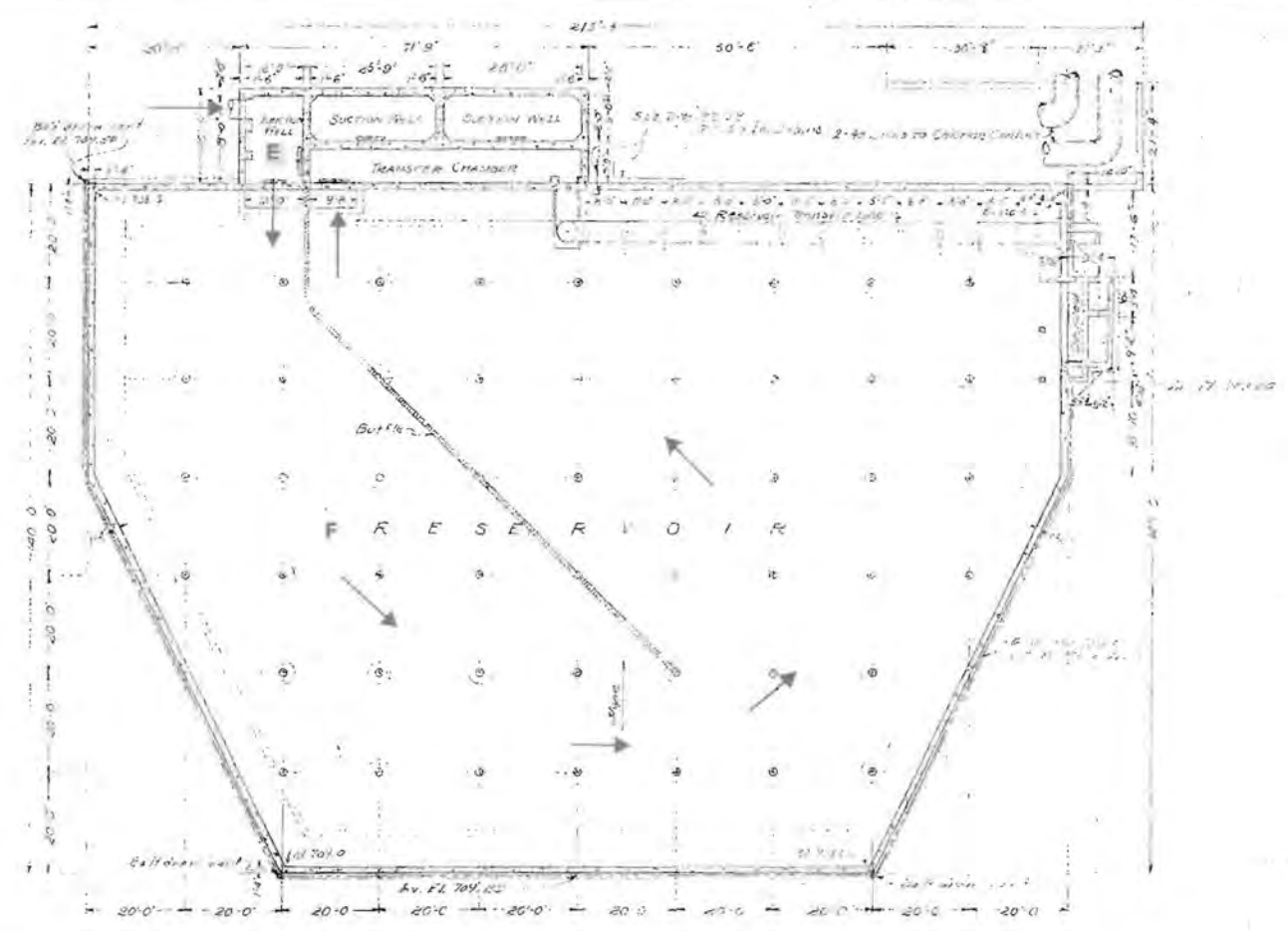
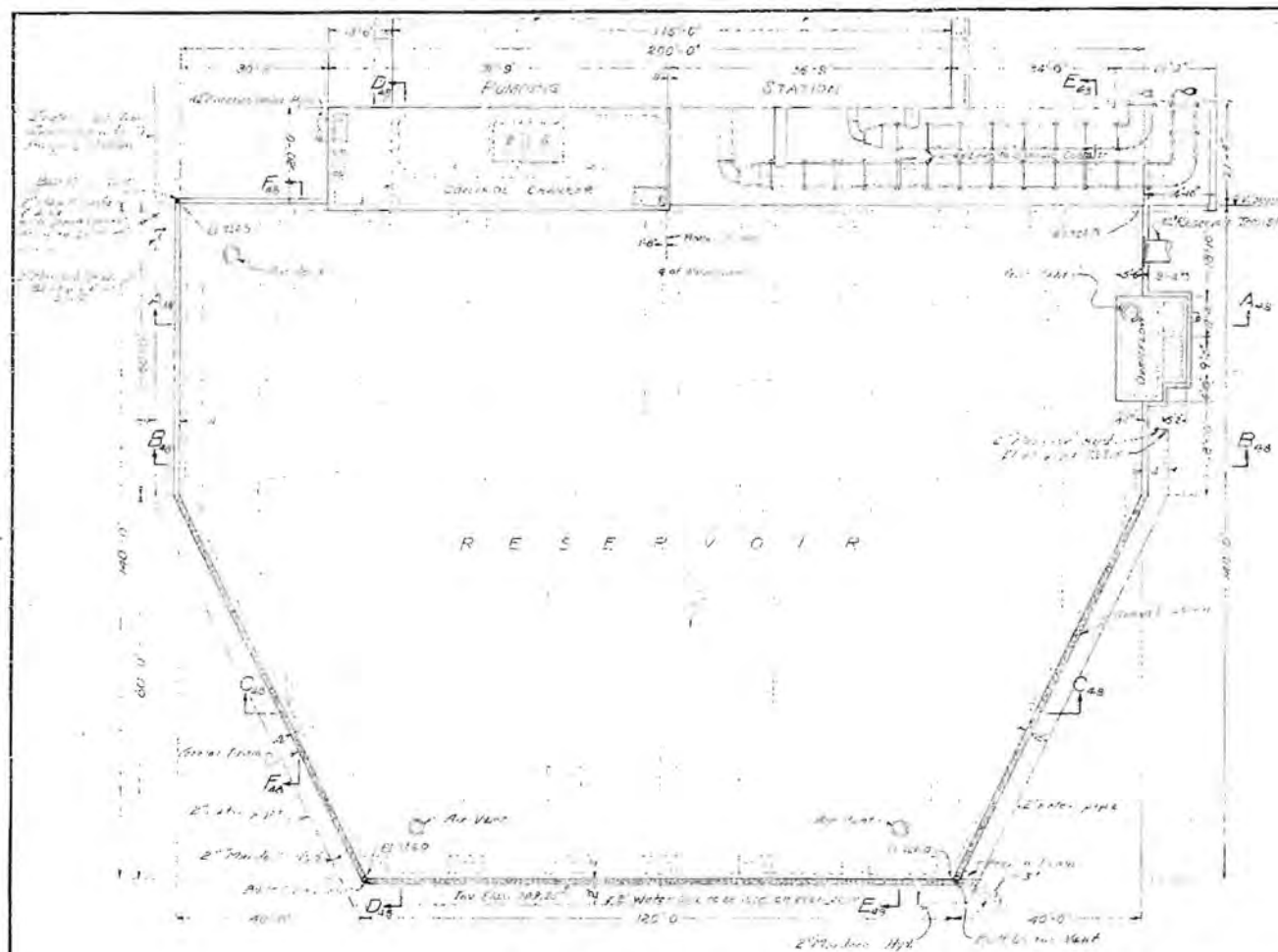
CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT
PUMPING STATION NO. 3
PLAN OF PUMP PIPING

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

S 22107-A2

NOV 1948

REV	5	MAR 89	Spot Piece Notations SBA
REV	4	FEB 89	Reissue H Life Pump 7024
REV	3	JAN 89	Reissue L Life Valve 7024
REV	2	DEC 88	Complete Details 7024
REV	1	Oct 88	Original Issue
DRAWN BY		7024	CHECKED BY

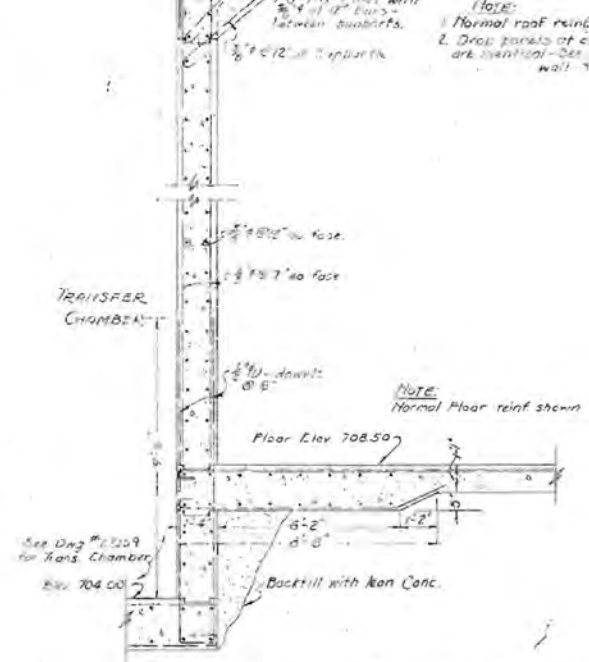
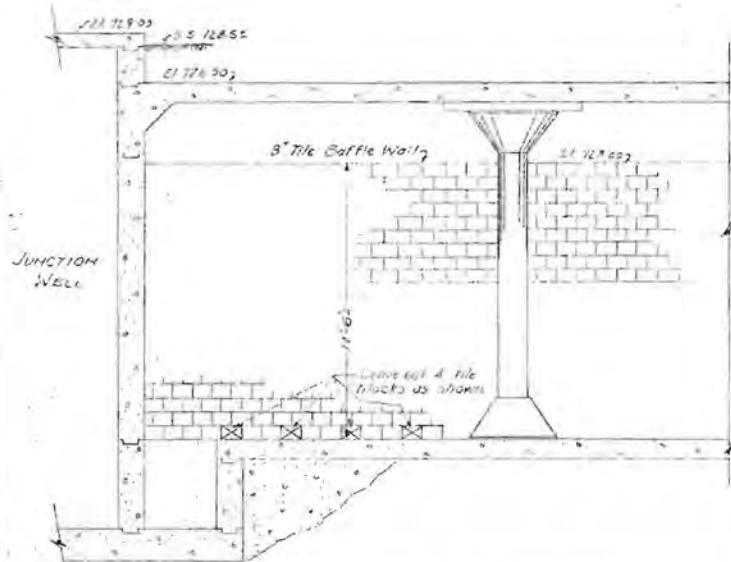


CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT
RESERVOIR NO.3
GENERAL PLANS & SECTIONS

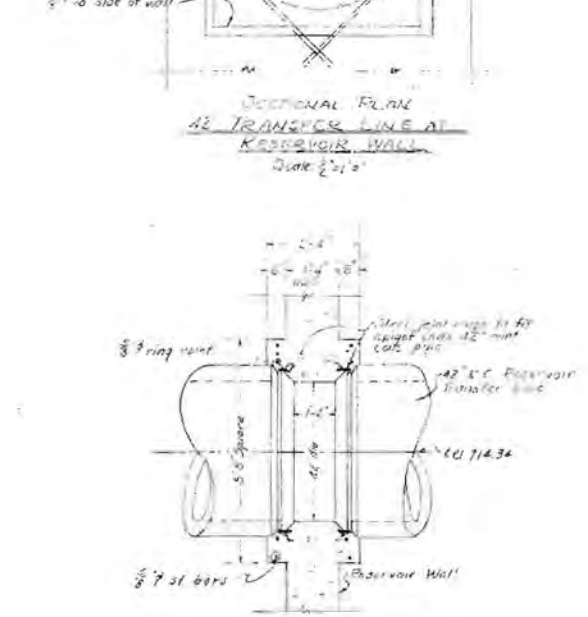
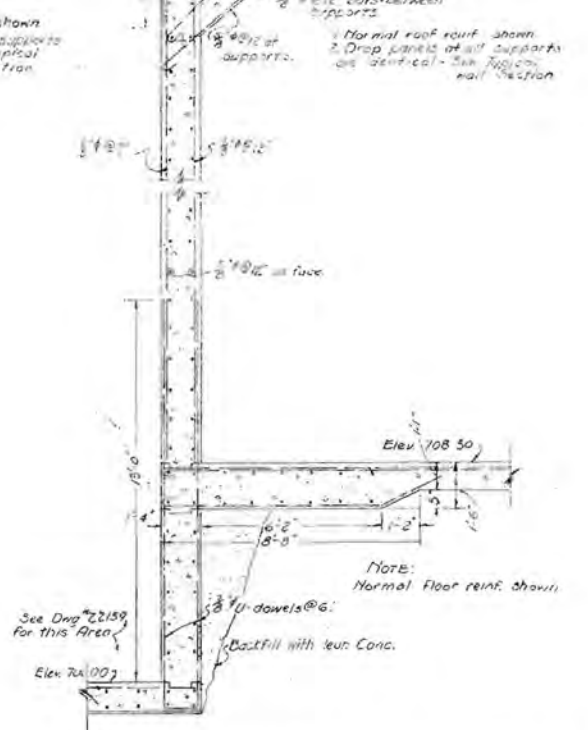
AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

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

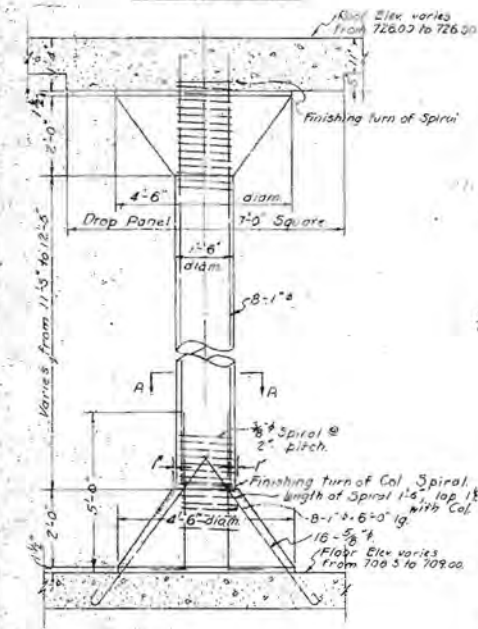
22148-2



known
supply to
pistol
from



SECTIONAL DRAWING

[illegible]

CONCRETE COVER FOR REINFORCING STEEL	
3"	for bottom face of all footings & deck slabs
2"	for all slabs and vertical walls
1 1/2"	for all floors or exposed dry slabs & beams

Roof Fill Detail
No Scale

Faries @ 728.00 to 728.50
Faries @ 726.00 to 726.50

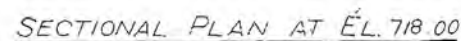
DETAIL

1'-0" Note: See concrete cover for
reinforcing steel this sheet.

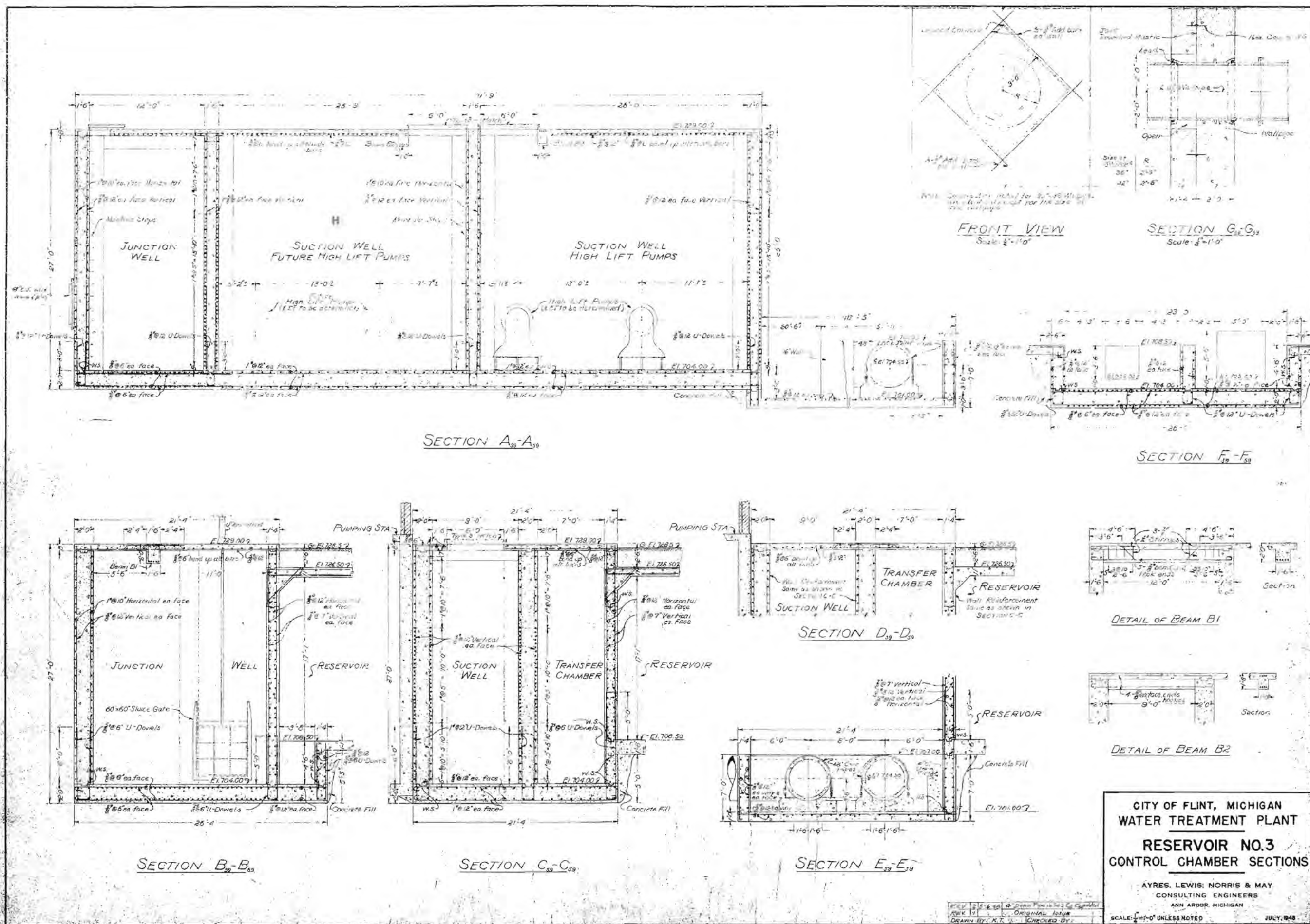
AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

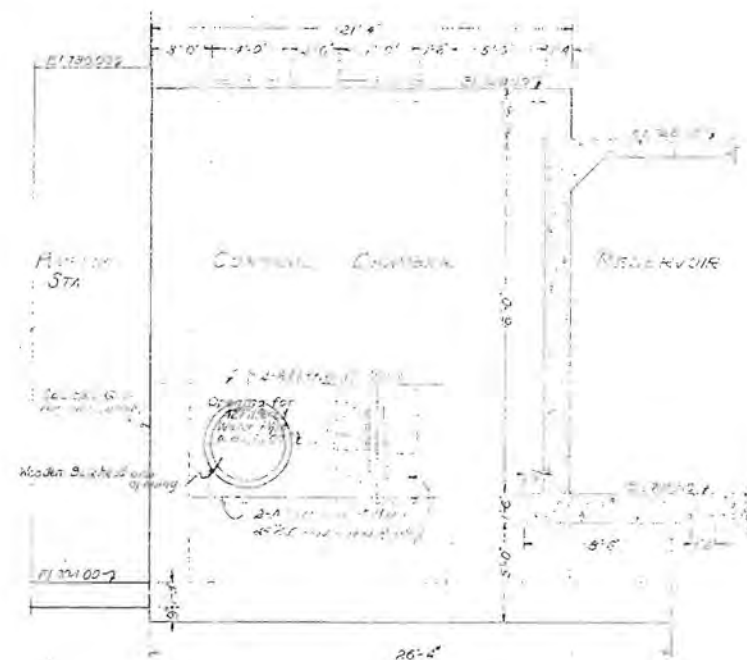
AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

SCALE: AS NOTED JULY, 1948

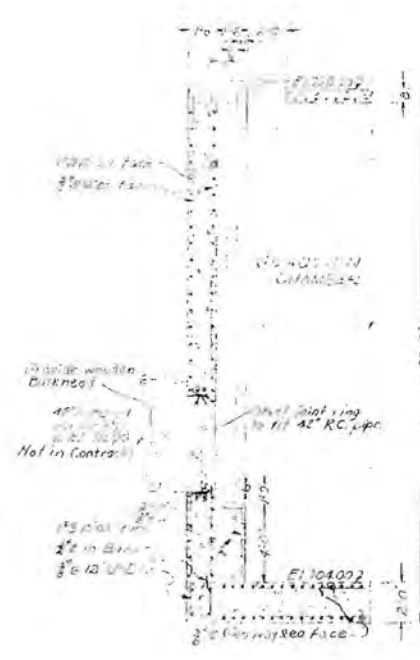


JULY 1941

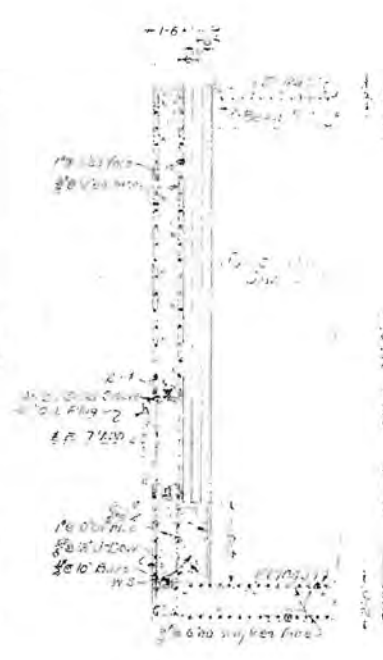




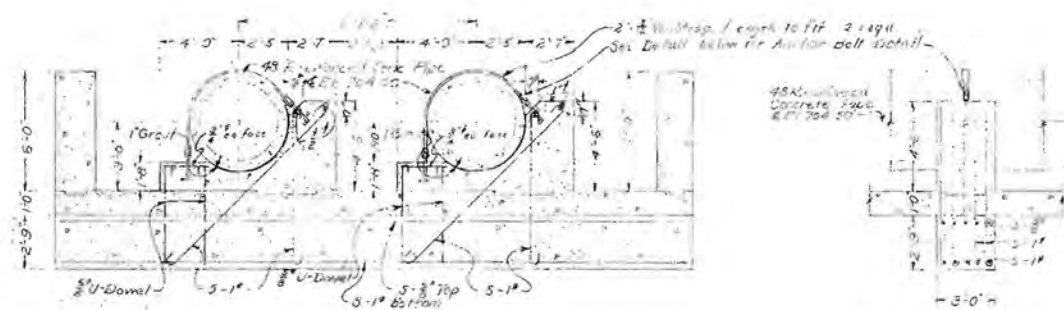
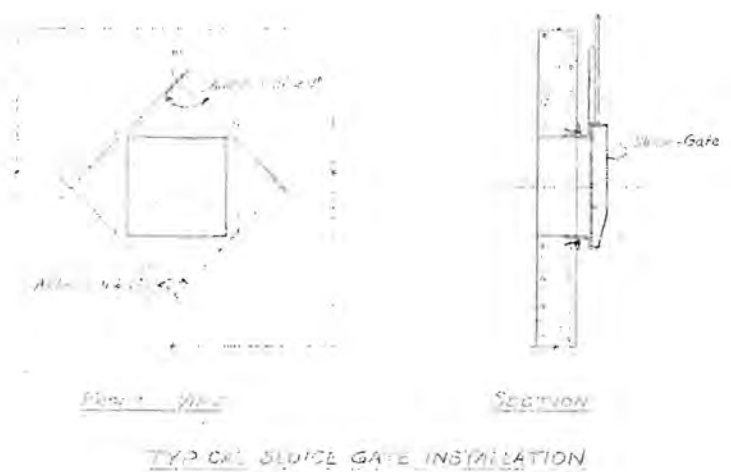
SECTION H-H100
Scale: 1/4" = 1'-0"



SECTION I-I100
Scale: 1/4" = 1'-0"

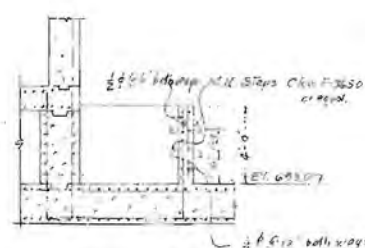


SECTION J-J100
Scale: 1/4" = 1'-0"

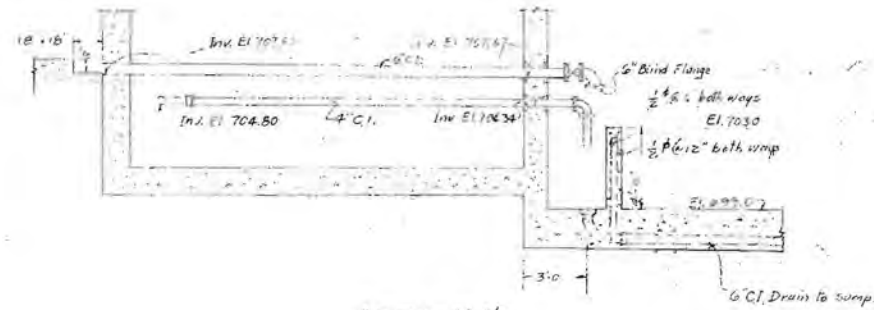


SECTION K-K100
Scale: 1/4" = 1'-0"

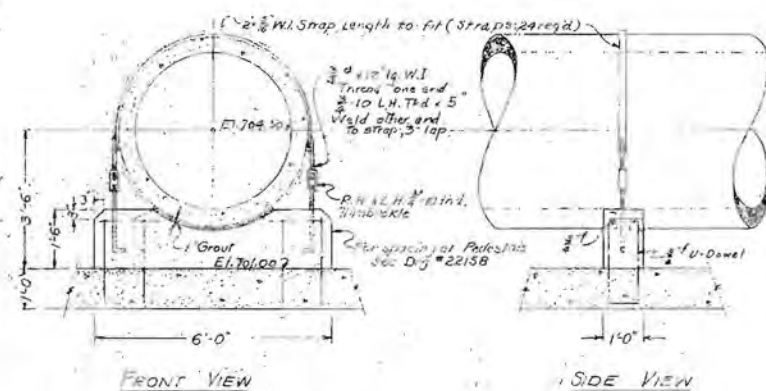
SECTION L-L100
Scale: 1/4" = 1'-0"



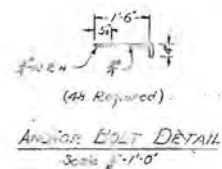
SECTION L-L100
Scale: 1/4" = 1'-0"



SECTION M-M100
Scale: 1/4" = 1'-0"



DETAIL OF PEDESTAL 'C'
Scale: 1/4" = 1'-0"



ANCHOR BOLT DETAIL
Scale: 1/4" = 1'-0"

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

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

REV. 2/5-48 481 Rec. L. 100 481 Rec. M. 100 481 Rec. N. 100
REV. 1/1 481 Rec. O. 100 481 Rec. P. 100 481 Rec. Q. 100
Drawn By: M.T. Checked By: M.T.

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

22160-2

Prysby, Mike (DEQ)

From: Hansen, Jeff <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
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

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 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

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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S

Volume (gallons)	2,000,000
Flowrate (MGD)	24
Flowrate (gpm)	16656
Flowrate (cfs)	37.11
Detention time (min)	120.08
Baffling Factor	0.28
Water Temperature (°C)	0.5
Min Cl (ppm)	2.9
Max pH	9
Min Cl for calculation	2.90
C*T Attained	97.50
C*T Req (1 log removal)	97.00
% inactivation attained	100.52

Title

0.5
log inactivation required

Assumptions:

Softening - pH 9.0, 0.5 deg C, 24.0 MGD, CT from 3MGAL Well only
Well's lowest operating level at 10 ft - 66.67% full.

100.5
% of required attained

S

Volume (gallons)	2,000,000
Flowrate (MGD)	24
Flowrate (gpm)	16656
Flowrate (cfs)	37.11
Detention time (min)	120.08
Baffling Factor	0.28
Water Temperature (°C)	0.5
Min Cl (ppm)	1.75
Max pH	8
Min Cl for calculation	1.75
C*T Attained	58.84
C*T Req (1 log removal)	57.81
% inactivation attained	101.77

Title

0.5

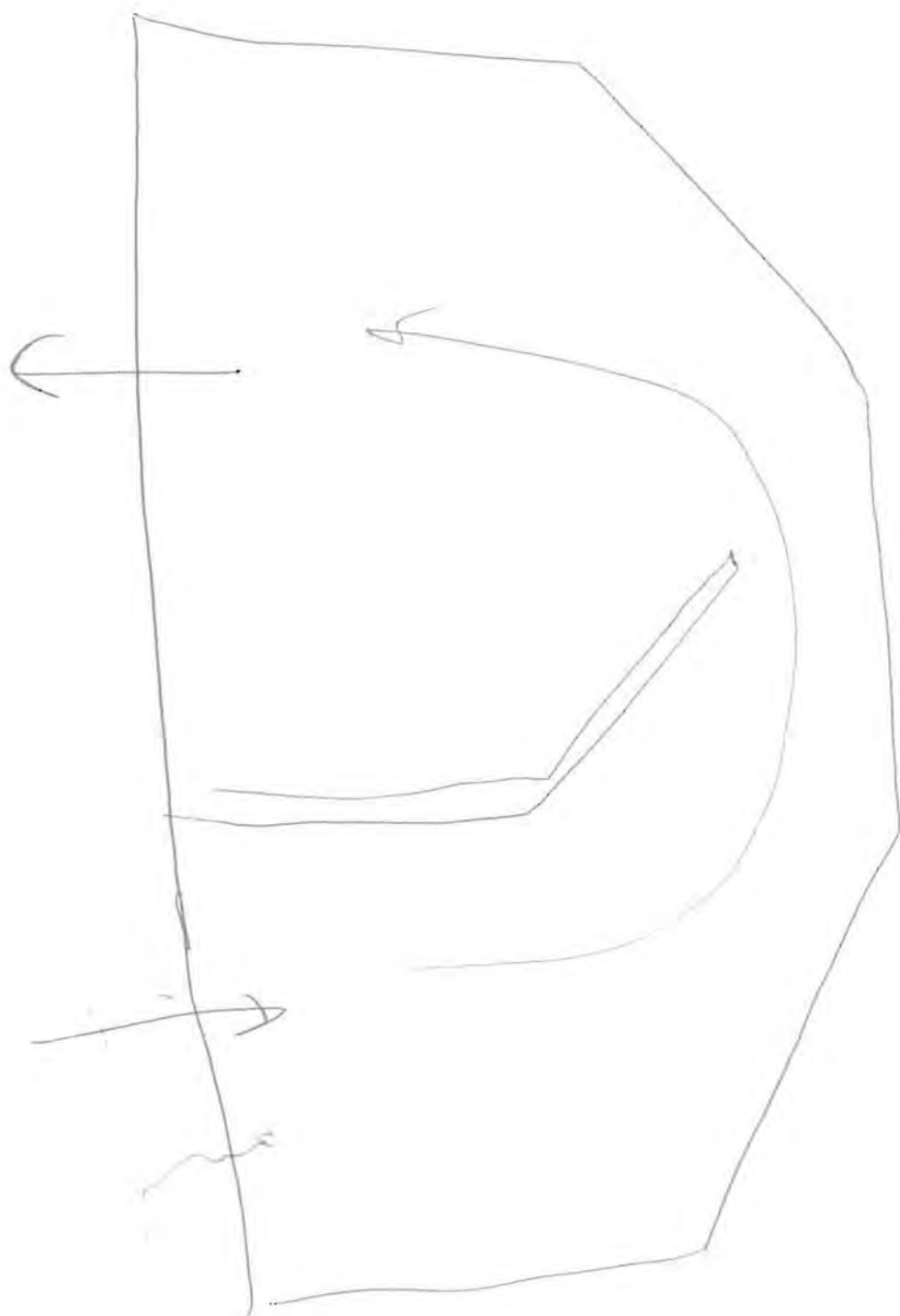
log inactivation required

101.8

% of required attained

Assumptions:

Softening - pH 8.0, 0.5 deg C, 24.0 MGD, CT from 3MGAL Well only
 Well's lowest operating level at 10 ft - 66.67% full.



S

Volume (gallons)	2,000,000
Flowrate (MGD)	24
Flowrate (gpm)	16656
Flowrate (cfs)	37.11
Detention time (min)	120.08
Baffling Factor	0.28
Water Temperature (°C)	0.5
Min Cl (ppm)	2.9
Max pH	9
Min Cl for calculation	2.90
C*T Attained	97.50
C*T Req (1 log removal)	97.00
% inactivation attained	100.52

10

Title

0.5
log inactivation required

100.5
% of required attained

Assumptions:

Softening - pH 9.0, 0.5 deg C, 18.0 MGD, CT from 3MGAL Well only
Well's lowest operating level at 10 ft - 66.67% full

GAC to be installed by
2 JUNE / 5 JULY

GP Firms
MANUFACTURE
A²

1/4" F8
Also 1/4" granulation
of sand to spec
- sand will
be good quality

- Pick the GAC closer to 10-50 lbs
ic - Filter 500B 300

* How long will the GAC last?

* Calgon to test GAC 1/4ly to 21m
from life span of GAC

* Small system column - yes

* did core samples - 40" column Six of cm
to calgon for testing

These calculations were performed using the regression method and may differ from those calculated using the tabular method. Please refer to Appendix E of EPA's Disinfection Profiling and Benchmarking Guidance Manual for more info. (EPA-815-R-99-013)

Prysby, Mike (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



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

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 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,

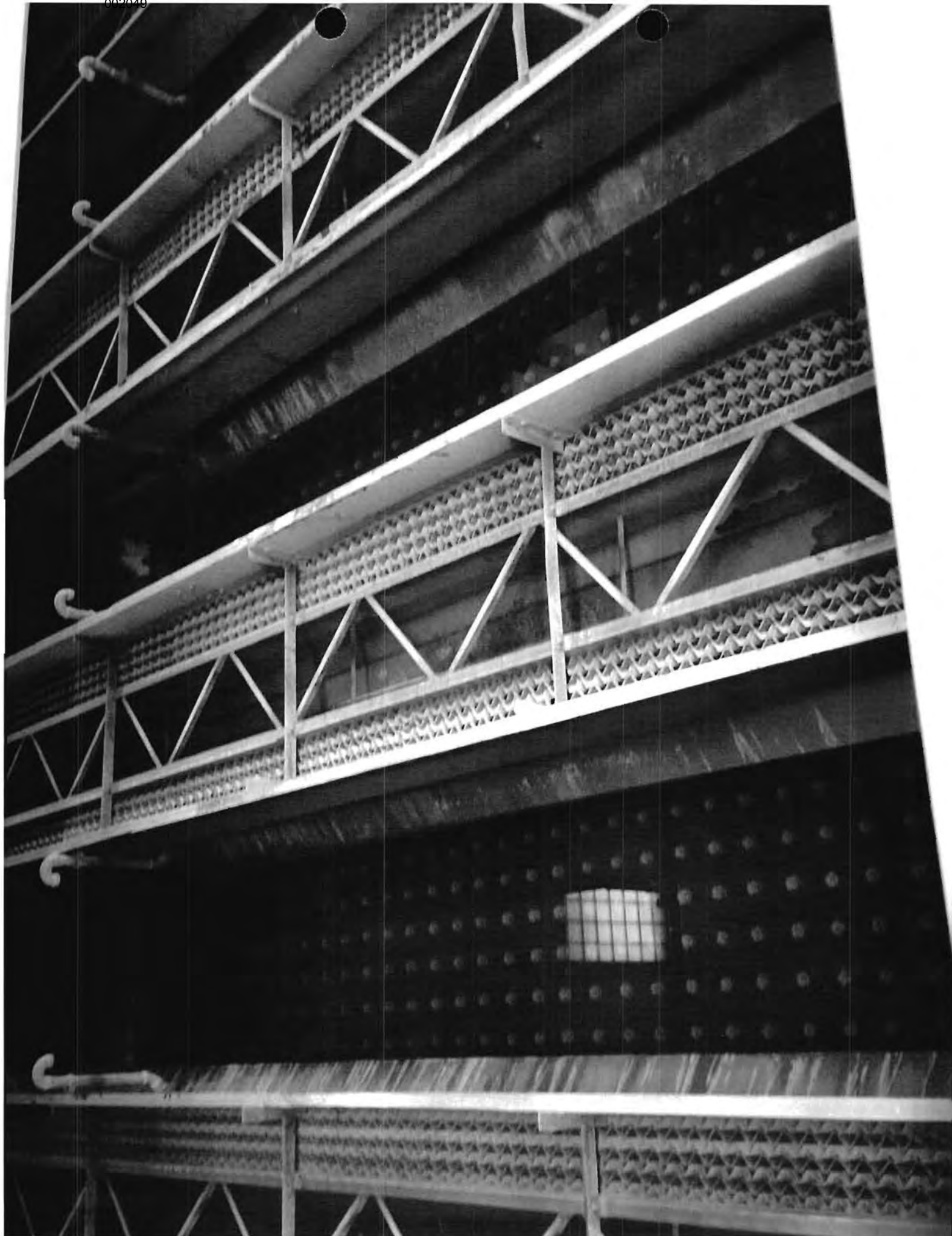
The revised plans received from you this morning along with the response and attachments from Jeff Hansen on July 8, 2015 address the majority of our comments sent on July 6, 2015. The removal and re-installation of the sand media; however, is not described. Please provide a description of the procedure to remove and re-install the sand filter media. An electronic response will be adequate.

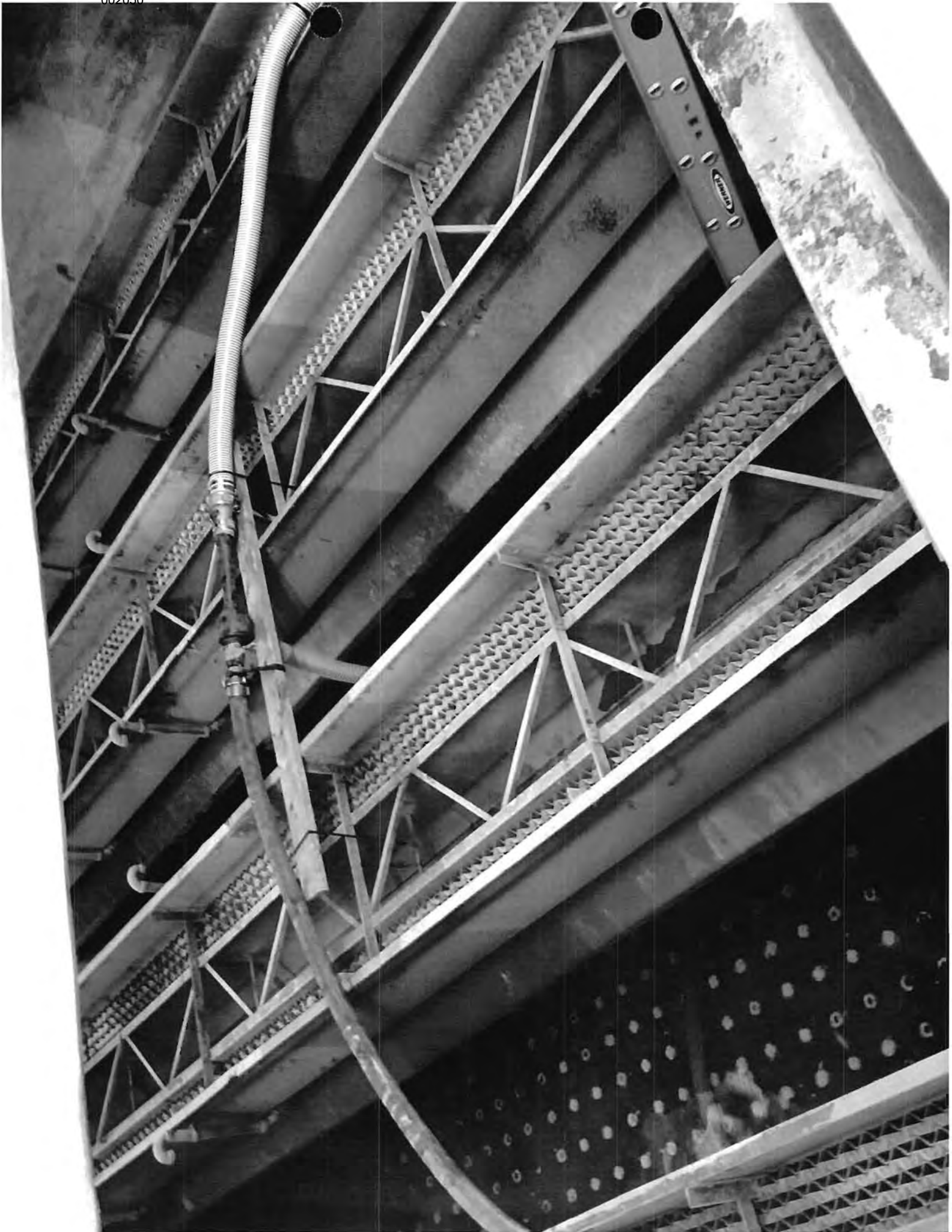
Michael Prysby, P.E.
 District Engineer











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-Wettable	<1%

*For general information only, not to be used as purchase specifications.

Recycling by Thermal Reactivation

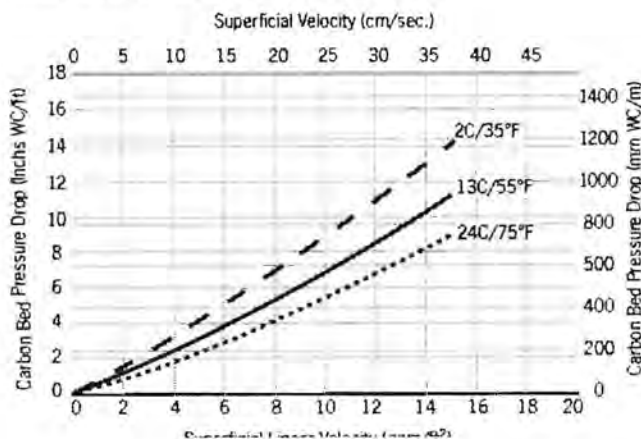
After a granular activated carbon's adsorptive capacity has been exhausted, it can be returned to Calgon Carbon for thermal reactivation. The thermal reactivation process involves a high temperature reaction with steam, which destroys the adsorbed organic compounds and restores the adsorptive capacity 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.

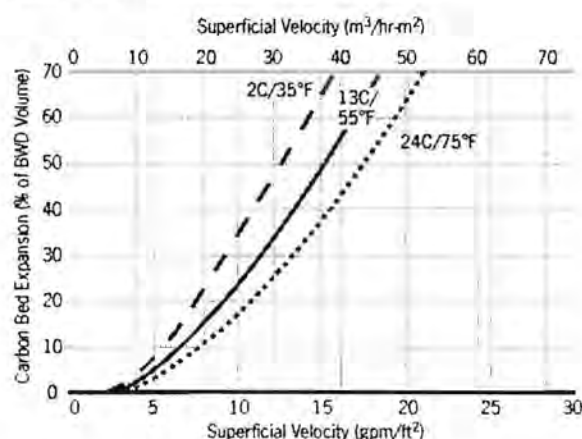
Pressure Drop

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 Filtrasorb.

Making Water and Air Safer and Cleaner

www.calgoncarbon.com



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Singapore 038989
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+65 6221 3554 Fax

Your local representative



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.

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.

6. Final freeboard measurements are taken after the backwash has been completed to verify that the proper amount of carbon has been installed.
7. 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.
8. This procedure is repeated for each filter to be exchanged.
9. 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.



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.

BASIS OF DESIGN
FILTER MEDIA REPLACEMENT WITH GRANULAR ACTIVATED CARBON (GAC)
CITY OF FLINT

1. GENERAL DESCRIPTION

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

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

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

2. DESIGN CRITERIA

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

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

Selected WTP design flow = 24 MGD

Maximum WTP flow expected = 30 MGD

Minimum WTP flow expected = 8 MGD

3. MEDIA DESIGN

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

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

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

B. Sand Media

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

C. Dual Media Performance

- Sand settling velocity greater than GAC settling velocity
- $D_{90} \text{ of GAC} / D_{10} \text{ of sand} < 4.0$ to avoid excessive intermixing
- Adequate expansion of both medias during backwash without media loss
- Combined head loss of proposed medias less than combined head loss of existing sand and anthracite

4. INTERMEDIATE CHLORINE FEED

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

CITY OF FLINT WTP
Filter Media Replacement
Basis of Design

Notes

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

Area / Filter = 700 sft
 Number of Filters = 12

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

Top of Underdrain elev =	723.58
Washwater Trough Weir elev =	730.67
Operating Water Level =	734.00
Top of Filter Basin / Floor elev =	736.00
Filter BW Dimensional D =	7.08
Existing Sand D =	12.00 inches = 1.00 ft
Existing Anthracite D =	18.00 inches = 1.50 ft

Proposed Sand D =	12.00 inches = 1.00 ft
Proposed GAC D =	18.00 inches = 1.50 ft
Proposed Water Depth =	7.92 ft
Max Cold BW Flow rate / filter =	7910 gpm = 11.3 gpm/sft
Max Warm BW Flow rate / filter =	11900 gpm = 17.0 gpm/sft
Max Sand Expanded D =	14.2 inches = 1.18 ft = 18%
Max GAC Expanded D =	45.10 inches = 3.76 ft = 150%
Total BW Expanded D =	59.30 inches = 4.94 ft
Proposed BW Freeboard =	2.14 ft
Proposed # of Filters to Replace	12
GAC Volume =	12,600 cft
GAC apparent density =	33.7 lbs/cft
GAC Total Weight =	424,620 lbs = 212.3 tons

See following pages for details

To match current BW flow rate
 Use when water temp > 65 degrees
 Occurs at cold temps

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

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

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

Calculations attached separately

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



**Lockwood, Andrews
 & Newnam, Inc.**
 A LEVI & TRACY COMPANY

CITY OF FLINT- DEPARTMENT OF PUBLIC UTILITIES

GAC Filter Evaluation

Filter Media Analysis 2015 1st Stage

Date: 06/03/15

By: JRH

Data Entry:

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

COMMENTS

SITE LOCATION	10 States		Filtrisorb 400		Filtrisorb 300		300/400 Mix		New sand / 300		New sand / 400	
Media Type	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	New sand	GAC	New sand	GAC
Bed Depth (in)	12	18	12	18	12	18	12	18	12	18	12	18
Uniformity Coefficient	2.30	1.65	2.30	1.90	2.30	2.10	2.30	1.925	1.70	2.10	1.65	1.90
Effective Size (mm)	0.400	0.550	0.40	0.625	0.40	0.800	0.40	0.670	0.65	0.900	0.50	0.650
d60% Size (mm)	0.920	0.908	0.920	1.188	0.920	1.680	0.920	1.290	1.105	1.890	0.825	1.235
d90% Size (mm)	1.607	1.269	1.607	1.826	1.607	2.762	1.607	2.000	1.577	3.107	1.154	1.899
Porosity	0.40	0.50	0.40	0.614	0.40	0.586	0.40	0.55	0.40	0.586	0.40	0.586
Specific Gravity	2.554	1.45	2.554	1.40	2.554	1.40	2.554	1.45	2.500	1.40	2.500	1.40
Media Density (#/cf)	159.4	90.5	159.4	87.4	159.4	87.4	159.4	90.5	156.0	87.4	156.0	87.4
Min. Fluidization Rate (gpm/sf)	7.03	2.14	7.03	3.12	7.03	5.87	7.03	4.05	9.49	7.27	5.57	3.35
Reynolds Number	2.447	0.734	2.447	1.403	2.447	3.731	2.447	1.978	3.968	5.201	1.741	1.567
Correction Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Min. Fluidization Rate (gpm/sf)	7.03	2.14	7.03	3.12	7.03	5.87	7.03	4.05	9.49	7.27	5.57	3.35
Unhindered Settling Vel. (ft/sec)	20.68	6.20	20.68	11.85	20.68	31.53	20.68	16.71	33.53	43.95	14.71	13.24
Expansion Coefficient (n)	3.287	3.708	3.287	3.475	3.287	3.151	3.287	3.358	3.132	3.048	3.401	3.437
Bed Porosity Coefficient (k)	142.82	27.92	142.82	17.00	142.82	31.61	142.82	30.16	167.27	37.07	125.75	21.03
Porosity (expanded)	0.462	0.784	0.462	0.889	0.462	0.721	0.462	0.747	0.423	0.677	0.492	0.835
Bed Depth Expanded (in)	13.4	41.6	13.4	62.7	13.4	26.8	13.4	32.0	12.5	23.1	14.2	45.1
% Expanded Bed	11.6	131.0	11.6	248.3	11.6	48.6	11.6	77.5	4.0	28.3	18.2	150.3
d90gac/d10s Ratio	3.173		4.564		6.905		5.001		4.780		3.797	
Discussion/Notes									Use 16.2 gpm/sft BW		Use 11.3 gpm/sft BW	



CITY OF FLINT- DEPARTMENT OF PUBLIC UTILITIES

GAC Filter Evaluation

Filter Media Analysis 2015 1st Stage

Date: 06/03/15

By: JRH

Data Entry:

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

COMMENTS

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



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

CHLORINE CONCENTRATION (mg/L)	pH≤6 Log Inactivation						pH=6.5 Log Inactivation						pH=7.0 Log Inactivation						pH=7.5 Log Inactivation					
<=0.4	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
0.6	23	46	69	91	114	137	27	54	82	109	136	163	33	65	98	130	163	195	40	79	119	158	198	237
0.8	24	47	71	94	118	141	28	56	84	112	140	169	33	67	100	133	167	200	40	80	120	159	199	239
1	24	48	73	97	121	145	29	57	86	115	143	172	34	68	103	137	171	205	41	82	123	164	205	246
1.2	25	49	74	99	123	148	29	59	88	117	147	176	35	70	105	140	175	210	42	84	127	169	211	253
1.4	25	51	76	101	127	152	30	60	90	120	150	180	36	72	108	143	179	215	43	86	130	173	216	259
1.6	26	52	78	103	129	155	31	61	92	123	153	184	37	74	111	147	184	221	44	89	133	177	222	266
1.8	26	52	79	105	131	157	32	63	95	126	155	189	38	75	113	151	188	226	46	91	137	182	228	273
2	27	54	81	108	135	162	32	64	97	129	161	193	39	77	116	154	193	231	47	93	140	186	233	279
2.2	28	55	83	110	138	165	33	66	99	131	164	197	39	79	118	157	197	236	48	95	143	191	238	286
2.4	28	56	85	113	141	169	34	67	101	134	169	201	40	81	121	161	202	242	50	99	149	198	248	297
2.6	29	57	86	115	143	172	34	68	103	137	171	205	41	82	124	165	206	247	50	99	149	199	248	298
2.8	29	58	88	117	146	175	35	70	105	139	174	209	42	84	126	168	210	252	51	101	152	203	253	304
3	30	59	89	119	148	178	36	71	107	142	178	213	43	86	129	171	214	257	52	103	155	207	258	310
3	30	60	91	121	151	181	36	72	109	145	181	217	44	87	131	174	218	261	53	105	158	211	263	316
CHLORINE CONCENTRATION (mg/L)	pH=8.0 Log Inactivation						pH=8.5 Log Inactivation						pH=9.0 Log Inactivation											
<=0.4	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0						
0.6	46	92	139	185	231	277	55	110	165	219	274	329	65	130	195	260	325	390						
0.8	48	95	143	191	238	286	57	114	171	228	285	342	68	136	204	271	339	407						
1	49	98	148	197	246	295	59	113	177	236	295	354	70	141	211	281	352	422						
1.2	51	101	152	203	253	304	61	122	183	243	304	365	73	146	219	291	364	437						
1.4	52	104	157	209	261	313	63	125	188	251	313	376	75	150	226	301	376	451						
1.6	54	107	161	214	268	321	65	129	194	258	323	387	77	155	232	309	387	464						
1.8	55	110	165	219	274	329	66	132	199	265	331	397	80	159	239	318	398	477						
2	56	113	169	225	282	338	68	136	204	271	339	407	82	163	245	326	408	489						
2.2	55	115	173	231	288	346	70	139	209	278	348	417	83	167	250	333	417	500						
2.4	59	118	177	235	294	353	71	142	213	284	355	426	85	170	256	341	426	511						
2.6	60	120	181	241	301	361	73	145	218	290	363	435	87	174	261	348	435	522						
2.8	61	123	184	245	307	368	74	148	222	296	370	444	89	178	267	355	444	533						
3	63	125	188	250	313	375	75	151	226	301	377	452	91	181	272	362	453	543						
3	64	127	191	255	318	382	77	153	230	307	383	460	92	184	276	369	460	552						

Source: AWWA, 1991.



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

DESIGN NOTES AND COMPUTATIONS

SUBJECT:

FLINT WTP - G4C

SHEET NO.

OF

HEAD LOSS THROUGH MEDIA

$$h_L = \frac{1.067 V^2 D}{\phi g \epsilon^4} \cdot \frac{C_D f}{d} \quad \left\{ \begin{array}{l} \text{ROSE} \\ \text{EQUATION} \end{array} \right.$$

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

$$V_{\max} @ 3 \text{ gpm/sft}$$

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

$$C_D = \frac{24}{R} + \frac{3}{\sqrt{R}} + 0.34$$

$$\phi = \text{shape factor}$$

- (0.82 - sand)
- (0.80 - G4C)
- (0.73 - crushed, angular sand)

$$\epsilon = \text{porosity}$$

$$f = \text{mass fraction of sand particles @ dia. (d)}$$

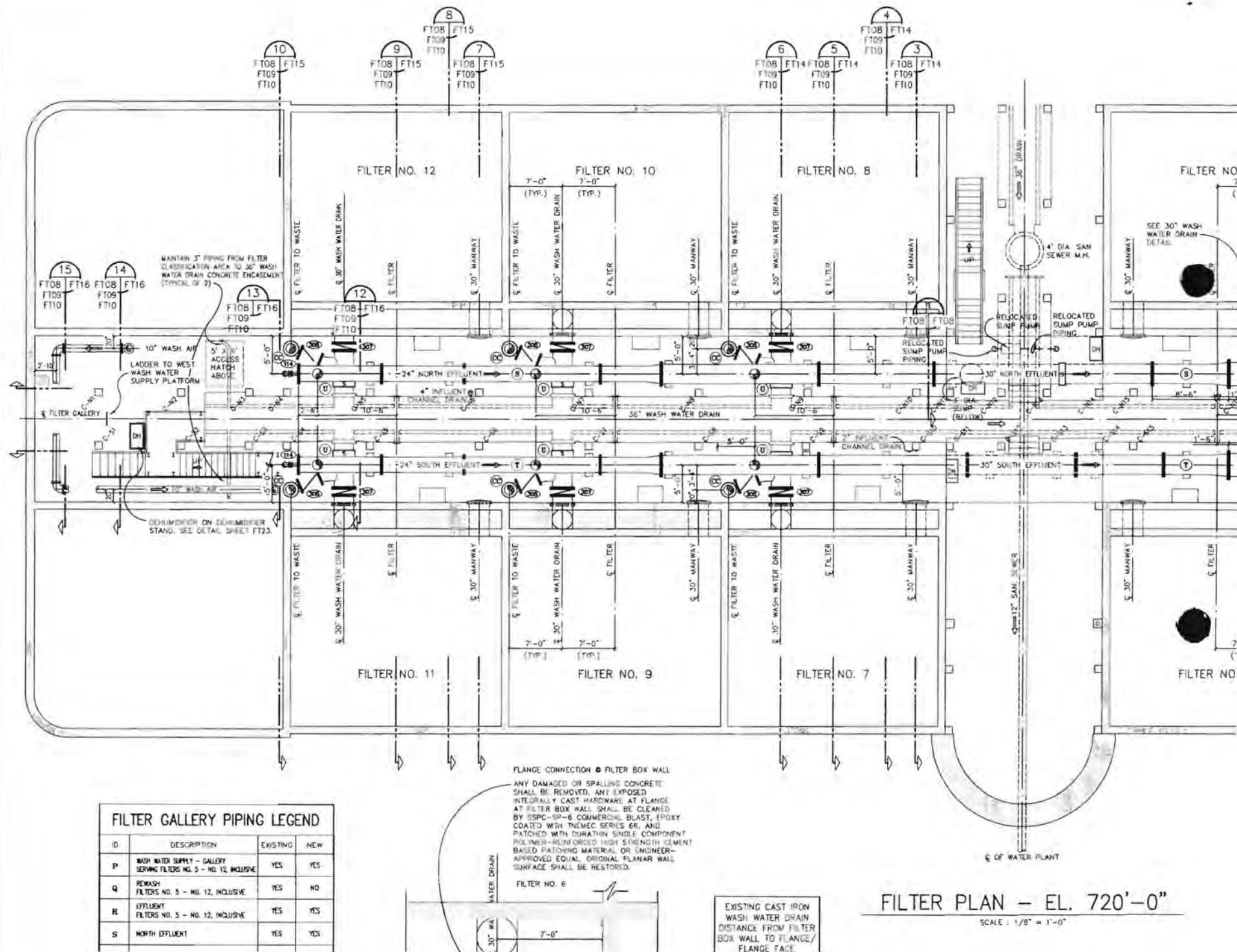
SEE SPREADSHEET CALCS FOR EACH MEDIA

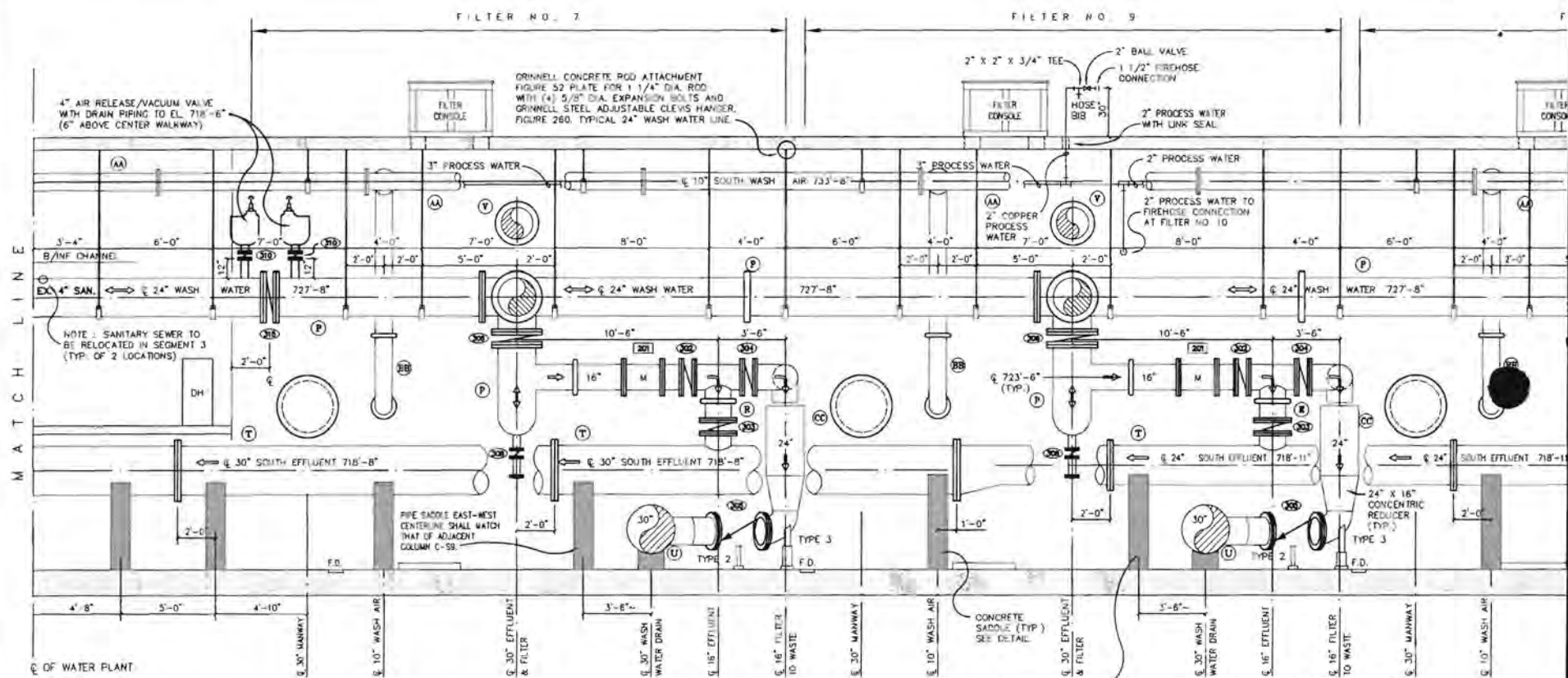
Existing Sand									
Shape factor		0.82							
Porosity =		0.4							
Depth =		12 in =		1.0 ft					
Mesh	d	f	R	Cd	(Cd)(f)/d				
#	mm	in	% passing	% retained	Cumulative				
8	2	0.07874	0.00656	1	0	0	1.662	15.4	0.0
16	1.18	0.04645	0.00387	0.9925	0.0075	0.0075	1.099	25.0	48.5
30	0.6	0.02362	0.00197	0.3076	0.6849	0.6924	0.559	47.3	16.460
50	0.3	0.01181	0.00099	0.0256	0.282	0.9744	0.279	91.9	26.337
100	0.15	0.00591	0.00049	0.0087	0.0169	0.9913	0.140	180.2	6.188
200	0.075	0.00295	0.00025	0.005	0.0037	0.995	0.070	355.3	5.343
	0.0312	0.00123	0.00010	0	0.005	1	0.029	844.0	lost by wash
									54,376
Head loss =		3.83 ft							
Anthracite									
Shape factor		0.7							
Porosity =		0.45							
Depth =		18 in =		1.5 ft					
Mesh	d	f	R	Cd	(Cd)(f)/d				
#	mm	in	% passing	% retained	Cumulative				
8	2.38	0.09370	0.00781	0.95	0.05	0.05	2.182	13.5	86.3
18	1	0.03937	0.00328	0.1	0.9	0.950	0.909	29.9	8.203
30	0.6	0.02362	0.00197	0.04	0.01	0.960	0.545	48.4	246
40	0.4	0.01575	0.00131	0.01	0.03	0.990	0.363	71.4	1.631
100	0.15	0.00591	0.00049	0.0075	0.0025	0.993	0.136	184.6	938
200	0.075	0.00295	0.00025	0.005	0.0025	0.995	0.068	364.1	3,699
	0.0312	0.00123	0.00010	0	0.005	1	0.028	864.9	
									14,803
Head loss =		1.15 ft =		13.7 in					
Ex. mixed media HL =		4.98 ft							

Proposed Sand w/ 400										
Shape factor		0.82								
Porosity =		0.4								
Depth =		12 in =		1.0 ft						
Mesh	#	mm	d in	f ft	% passing	% retained	Cumulative	R	Cd	(Cd)(f)/d
~16	1,154	0.0454	0.00379	0.9	0.1	0.1	1.075	25.5	675	
~20	0.825	0.0325	0.00271	0.6	0.4	0.5	0.768	35.0	5,173	
35	0.5	0.0197	0.00164	0.1	0.4	0.9	0.466	56.3	13,724	
50	0.3	0.0118	0.00098	0.05	0.05	0.95	0.279	91.9	4,670	
100	0.15	0.0059	0.00049	0.005	0.045	0.995	0.140	180.2	16,476	
200	0.075	0.0030	0.00025	0.005	0	0.995	0.070	355.3	0	
	0.0312	0.0012	0.00010	0	0.005	1	0.029	844.0		lost by wash
										40,718
Head loss =		2.87 ft								

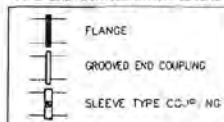
GAC - Filtrisorb 400										
Shape factor		0.8								
Porosity =		0.614								
Depth =		18 in =		1.5 ft						
Mesh	#	mm	d in	f ft	% passing	% retained	Cumulative	R	Cd	(Cd)(f)/d
8	2.38	0.0937	0.00781	0.99	0.01	0.01	2.162	13.5	17.3	
12	1.68	0.0661	0.00551	0.95	0.04	0.05	1.526	18.5	134.2	
30	0.6	0.0236	0.00197	0.1	0.85	0.9	0.545	48.4	20,913	
40	0.4	0.0157	0.00131	0.04	0.06	0.96	0.363	71.4	3,263	
100	0.15	0.0059	0.00049	0.01	0.03	0.99	0.136	184.6	11,252	
200	0.075	0.0030	0.00025	0.005	0.005	0.995	0.068	364.1	7,396	
	0.0312	0.0012	0.00010	0	0.005	1	0.028	864.9		
										42,976
Head loss =		0.84 ft =		10.1 in						

Pr. mixed media HL =		3.71 ft	
----------------------	--	---------	--

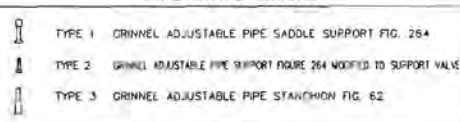




PIPE END CONFIGURATION LEGEND

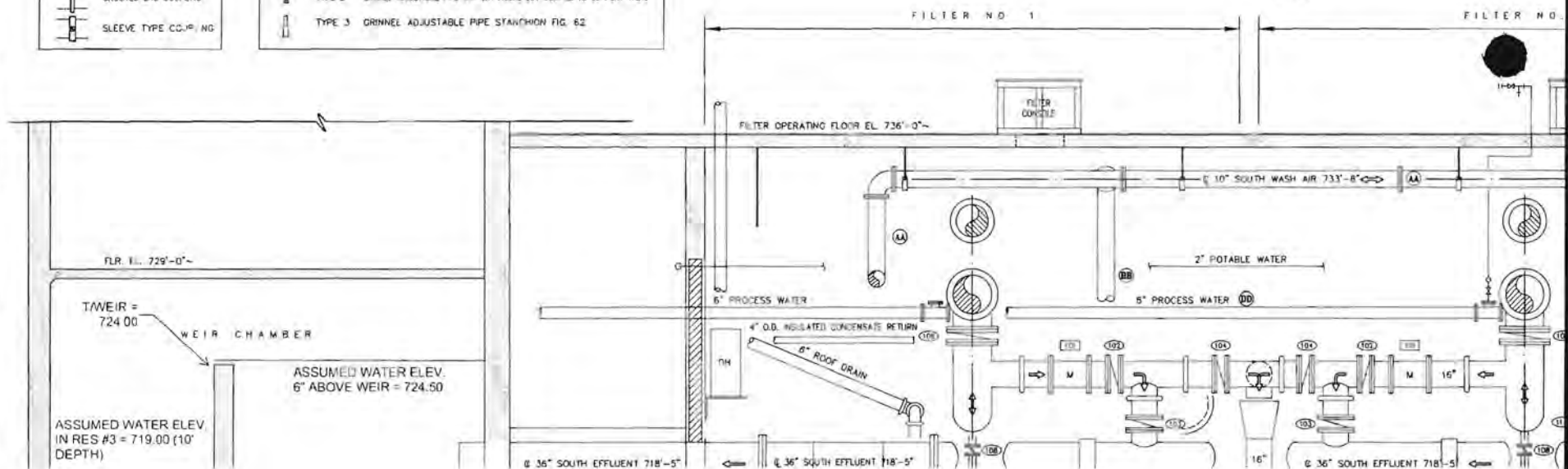


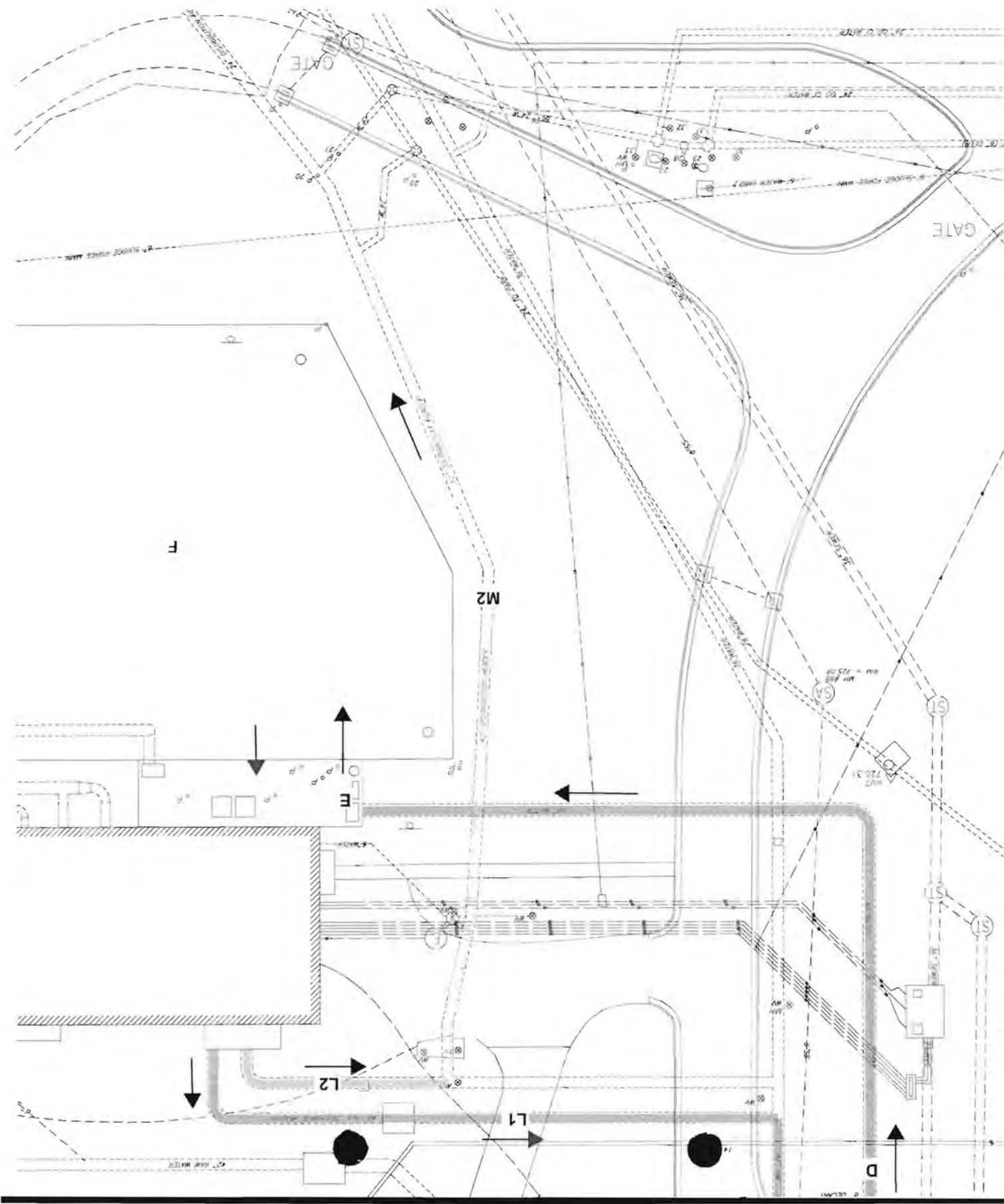
PIPE STAND LEGEND

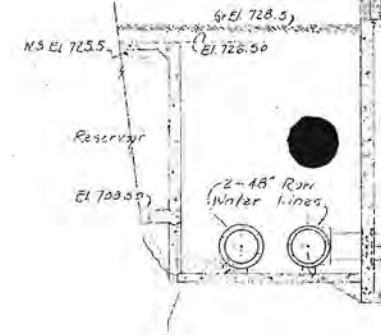


SECTION 2 WEST

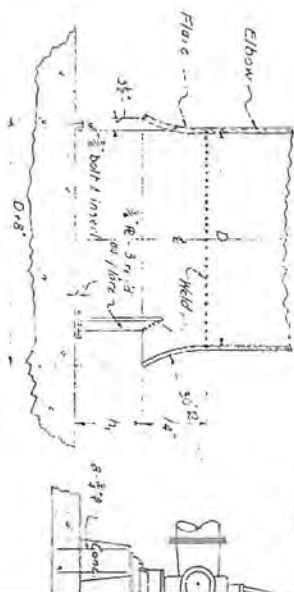
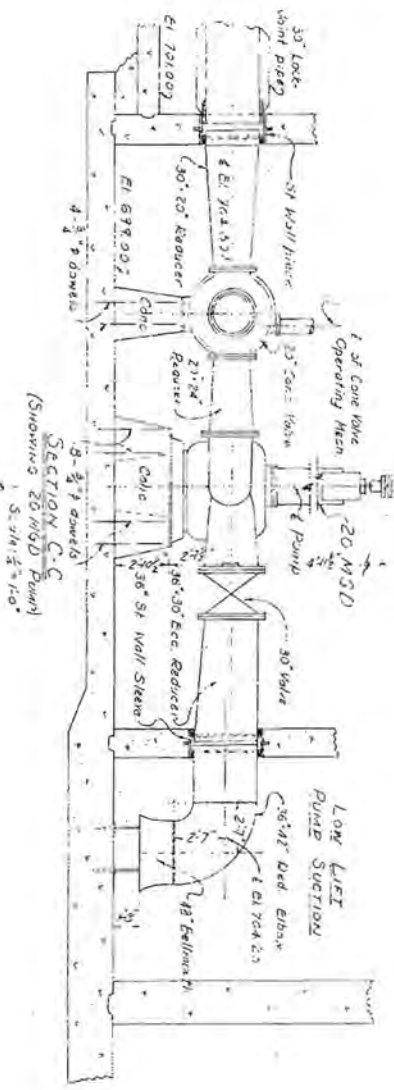
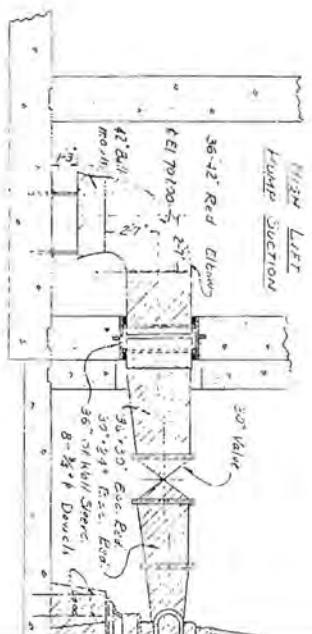
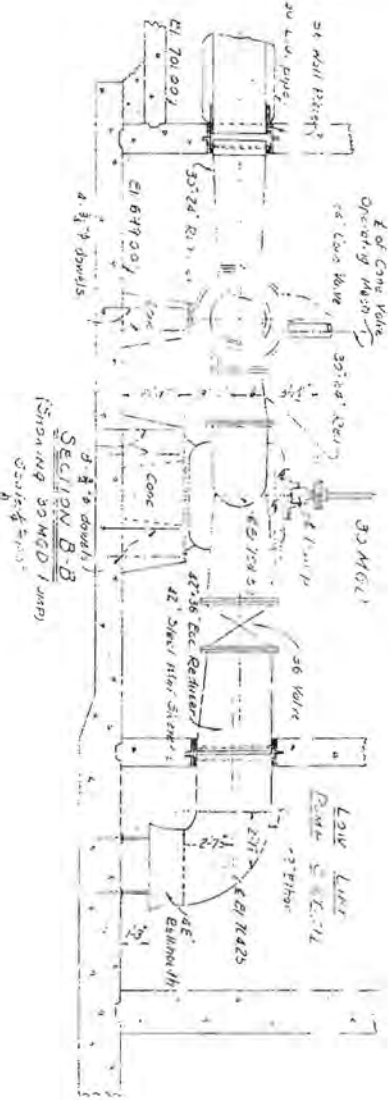
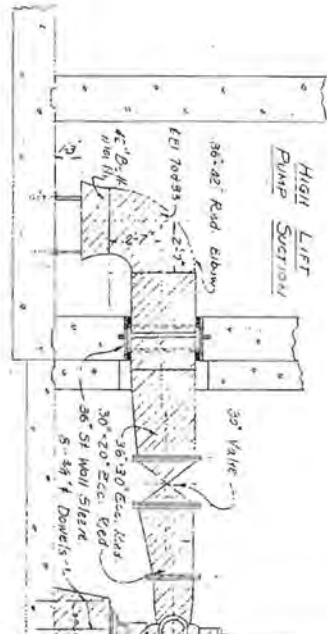
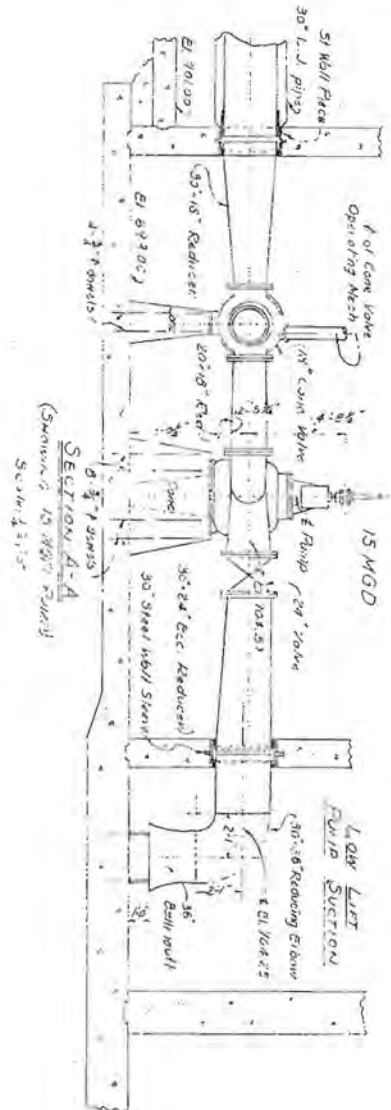
SCALE: 1/4" = 1'-0" FT08 FT13
FT09
FT10





[illegible]

2d. Core



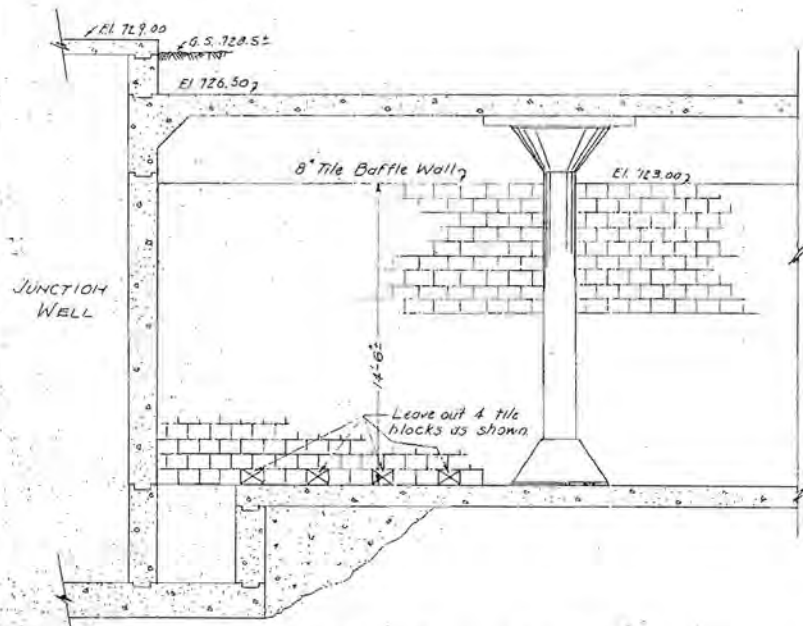
BELLMOUTH SUPPORT DETAILS

No Seal

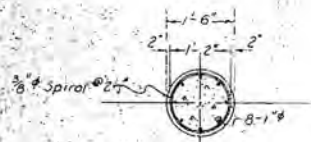
High Service	D_{10}	D_{50}	D_{90}
25 MG/D Pump	47°	50°	15.9°

E. Bumpi

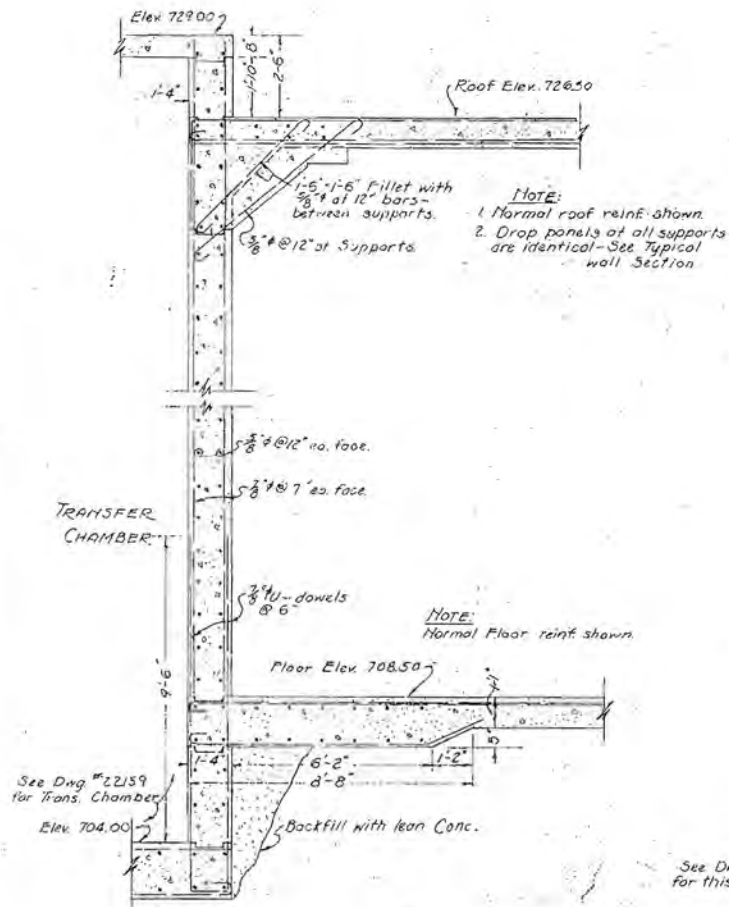
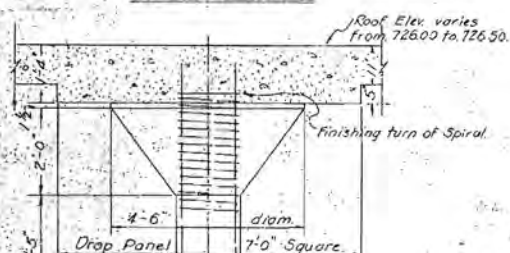
SECTION A₄₃-A₄₈



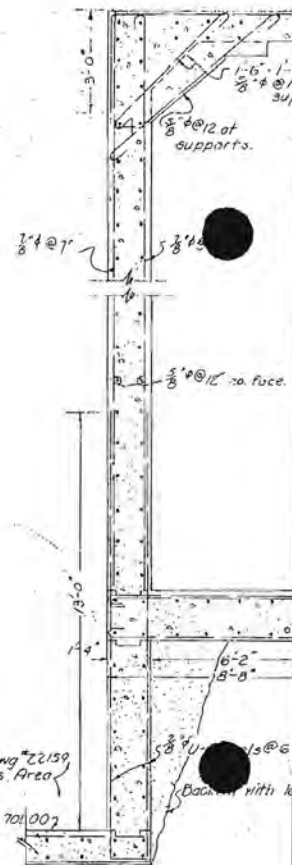
TYPICAL DETAIL OF TILE BAFFLE WALL

Scale: $\frac{1}{2}$ " = 1'-0"

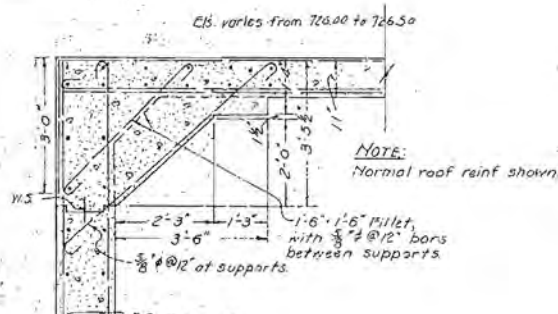
SECTIONAL PLAN A-A



WALL SECTION AT TRANSFER CHAMBER

Scale: $\frac{3}{8}$ " = 1'-0"

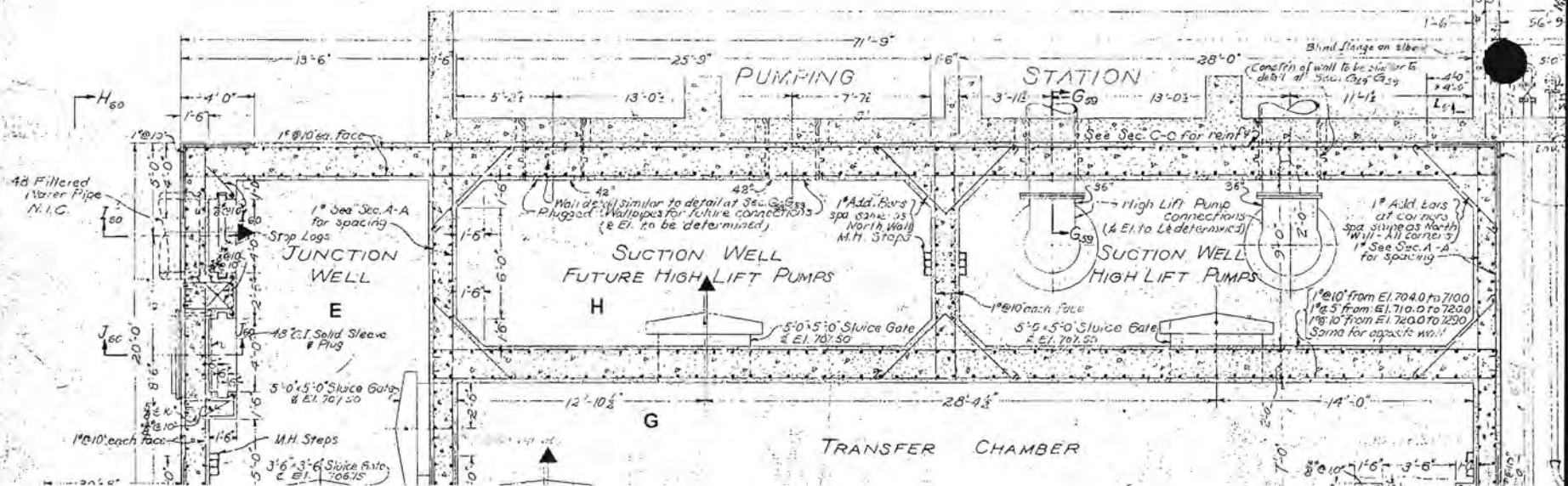
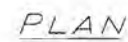
WALL SECTION EAST

Scale: $\frac{3}{8}$ " = 1'-0"

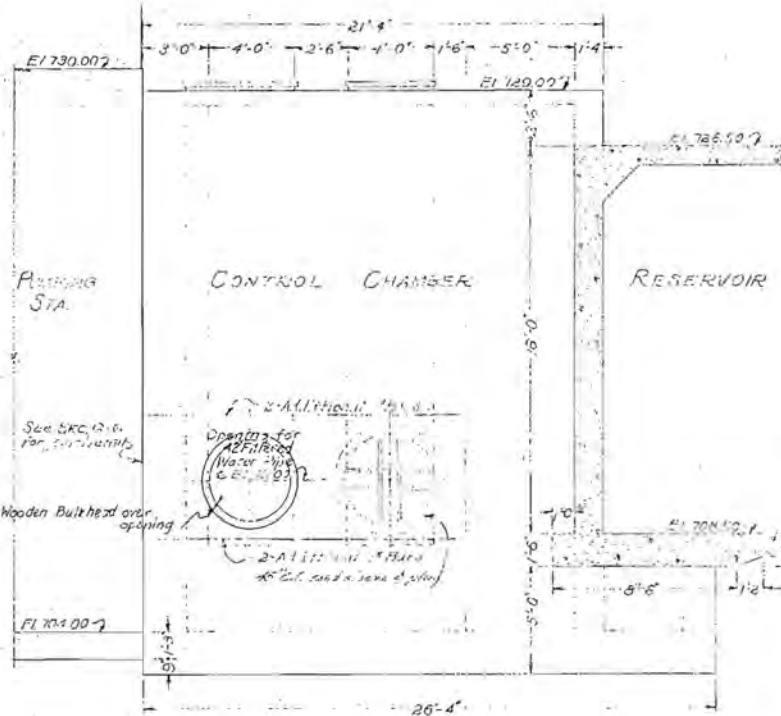
3/8" #8 @ 12" Corner bars

NOTE:

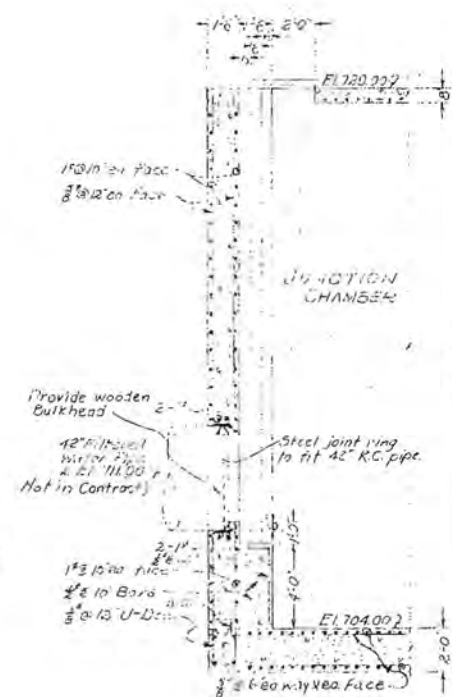
Normal wall reinf. shown.



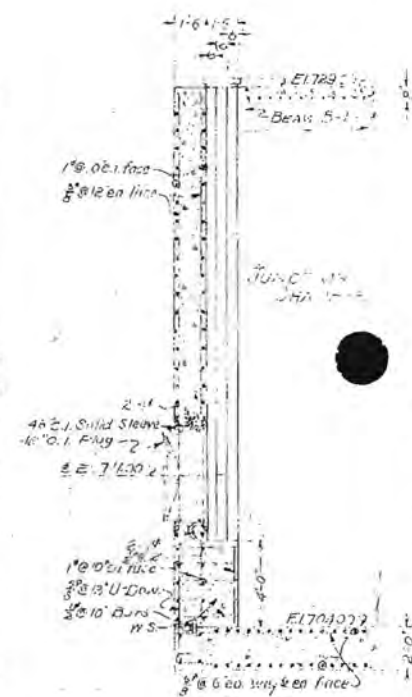




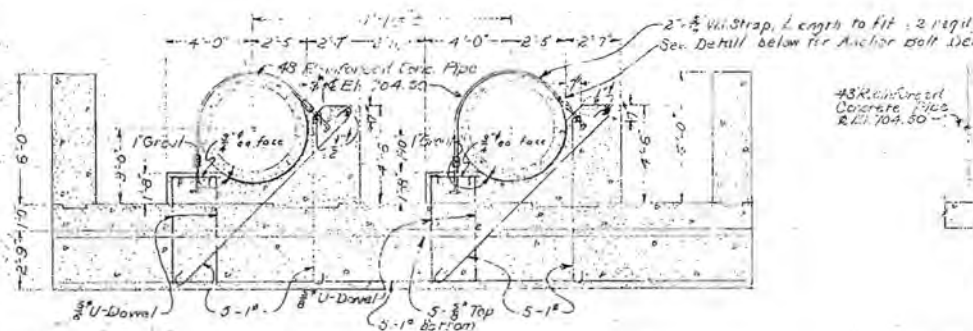
SECTION H₆₀-H₆₀
Scale: $\frac{1}{4}'' = 1'-0''$



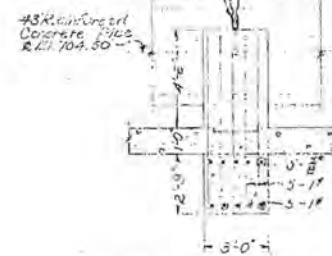
SECTION I₆₀-I₆₀
Scale: 3/4" = 1'-0"



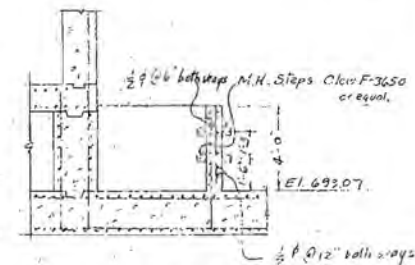
SECTION J_{60} - J_{80}
Scale: 2"=10'



PEDESTAL "B"
SECTION K₆₀-K₆₀
Scale: 1"=1'-0"



SECTIONAL VIEW
Scale: $\frac{1}{8}'' = 1'-0''$



SECTION L-L
Scale $\frac{1}{4} = 1'-0"$

CONTRACT DOCUMENTS AND SPECIFICATIONS
FOR
CITY OF FLINT WATER TREATMENT PLANT
PHASE II, SEGMENT 3 – FILTER MEDIA REPLACEMENT
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SECTION 02550 CHEMICAL PIPING VALVES
SECTION 02560 PIPE TESTING

DIVISION 3 CONCRETE

DIVISION 5 METALS

SECTION 05550 BOLTS, ANCHOR BOLTS AND EXPANSION ANCHORS

DIVISION 9 FINISHES

SECTION 09928 PROTECTIVE COATING SYSTEMS

DIVISION 11 EQUIPMENT

DIVISION 13 SPECIAL CONSTRUCTION

DIVISION 15 MECHANICAL

DIVISION 16 ELECTRICAL

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 151055 JUL - 4 2015

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 309, P.A. 1976

MFP

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
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**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
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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 I 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-seize 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
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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 NAF 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 OSHA 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 IP11	TF1 or IPF1
Steel-Structural Tanks, Pipes, Equipment Interior, Non-Immersion	SSPC-SP6	TP2 or IPP1	TI2 or IP11	TF4 or IPF2
Steel-Structural Tanks, Pipes, Equipment Interior, Non-Immersion (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-Immersed	NAPF 500-03-03	TP2 or IPP1	TI2 or IP13	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 IP11	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 IP11	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 IP11	TF4 or IPF2
Concrete Immersion Potable Water	SSPC-SP 13 ICRI-CSP5	TP3 or IPP6	N/A or IP12	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 IP14	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 IP11	TF7 or IPF1
Concrete Masonry Interior Exposed	Clean and Dry	TP5 or IPP9	TI2 or IP11	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 IP15	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	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 I 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 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



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

TRANSMITTAL

Filing Data Code 1-07

PLANNING

ENGINEERING

PROGRAM MANAGEMENT

Est. 1935

AUSTIN, TX
CHICAGO, IL
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☐ UPS ☐ DELIVERY SERVICE ☐ REGULAR MAIL
☐ FEDEX ☒ HAND DELIVER ☐ PICK-UP
☐ OVERNIGHT ☐ OTHER Extranet(To PM)

To: Mr. Mike Prysby		Date 6-29-15	
Company: MDEQ		Project Number 130-10701-001	
Address: 525 WEST ALLEGAN STREET Lansing, MI 48933		Routing:	
Project: City of Flint Water Treatment Plant – Sand/GAC Filter Replacement			
We Are Sending You: ☐ Shop Drawings ☐ Original Drawings ☒ Prints ☒ Specifications ☐ ☐		These Are Transmitted: ☐ As Requested ☒ For Your Use ☒ For Review and Comment ☐ For Your Signature ☐ ☐	

Quantity	Description
3	22x34 Plans – Sand/GAC Filter Replacement Project
3	Technical Specifications
1	Permit Application

Remarks

These plans are being submitted for permit issuance as discussed.

Distribution	Prepared By
1- Mike Glasgow 2- Brent Wright 3- File	Samir Matta, PE

1311 SOUTH LINDEN ROAD
SUITE B
FLINT, MI 48532
TEL 810.820.2682
FAX 810.820.2703
www.lan-rlc.com



PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS
(CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Environmental Quality (DEQ) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint Water Service Center 3310 E. Court Street Flint, MI 48506 WSSN: 2310	Permit Stamp Area (DEQ use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 151047 JUN 02 2015 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976 <i>MFP</i>	
2. Owner's Contact Person (provide name for questions): Contact: Rob Bincsik Title: Supervisor of Water Distribution & Sewer Phone: (810)766-7202		
3. Project Name (Provide phase number if project is segmented): 24-inch Water Main Replacement (contract/phase 2)	4. Project Location (City, Village, Township): City of Flint	5. County (location of project): Genesee

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY

cc:

DEQ
RESOURCE MANAGEMENT DIVISION

MAY 18 2015

LANSING DISTRICT

Issued by:



Reviewed by:



☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DEQ District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions **will be returned**. SEE EXAMPLES BELOW. Use additional sheets if needed.

4,500 feet of 24-inch water main from Pasadena Avenue and Iroquois Avenue,
West, along Pasadena Avenue,
North, seven blocks along Dupont Street,
East, approximately 100 feet along Bishop Avenue.

Then, 3,400 feet of 24-inch water main from approximately 150 feet west of Bishop Avenue and North Saginaw Street
along Bishop Avenue,
East, approximately 150 feet along Bishop Avenue,
North, approximately 200 feet along North Saginaw Street,
East, ten blocks along Wager Avenue to and through the Wager Avenue & Andrew Street/Horton Avenue intersection,
Terminating at Racer Trust Property along the east side of Andrew Street/Horton Avenue,
Water main is stubbed at Racer Trust Property for future additions and also connects to an existing 24" line running to the east within the Racer Trust Property.

Also, 1,800 feet of 8-inch water main from Pasadena Avenue and Dupont Street,
North, two blocks, then tied into existing line along West Myrtle Avenue.

Though minor with regard to the main work of the project, tie-ins/connection work (to existing 6-inch, 8-inch, and 16-inch lines) will also be performed at various intersections throughout the main route of the 24-inch watermain replacement.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address:

Jeffrey B. Markstrom, P.E.
 ROWE Professional Services Company
 P.O. Box 3748
 Flint, MI 48502
 (810)341-7500 jmarkstrom@rowepsc.com

8. Indicate who will provide project construction inspection:

- ☐ Organization listed in Box 1.
☒ Engineering firm listed in Box 7.
☐ Other - name, address, and phone number listed below.

9. Is a basis of design attached?

☐ YES ☒ NO

If no, briefly explain why a basis of design is not needed.

10. Are sealed and signed engineering plans attached?

☒ YES ☐ NO

If no, briefly explain why engineering plans are not needed.

11. Are sealed and signed construction specifications attached?

☒ YES ☐ NO

If specifications are not attached, they need to be on file at DEQ.

12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed?

☒ YES ☐ NO

If no, explain which deviations were made and why.

13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved?

☒ YES ☐ NO

If no, describe what coatings, additives or materials did not meet the applicable standard and why.

14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement?

(For projects not located in the public right-of-way, utility easements must be shown on the plans.)

☒ YES ☐ NO

If no, explain how access will be obtained.

15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451?

☐ YES ☒ NO

If yes, a wetland permit must be obtained.

16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules?

☐ YES ☒ NO

If yes, a flood plain permit must be obtained.

17. Is the project construction activity within 500 feet of a lake, reservoir, or stream?

☐ YES ☒ NO

If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?
☐ YES ☒ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☐ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☒ YES ☐ NO

If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) City of Flint

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☒ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DEQ.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, Robert Bincsik (name), acting as the Operator in Charge (title/position) for
 (print) (print)

The City of Flint (entity owning proposed facilities) certify that this project has
 (print)

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.

Robert Bincsik

Signature*

5-13-15

Date

910-766-7202

Phone

*Original signature only, no photocopies will be accepted.

05-11-15

ROWE Professional Services Company

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS

Attachment Sheet

City of Flint 24" Water Main Replacement – Contract 2

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☒ YES☐ NO

If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

Regarding item number 19 in the application above, the site will run adjacent to and slightly within the boundaries of the existing property currently owned by Racer Trust. This property used to be owned by GM and was previously utilized for the purposes of automobile manufacturing (industrial plant use). Per prior submittal for this project, any excavated contaminated soil will be placed back into the trench. No soil is to leave the site.



ROWE PROFESSIONAL SERVICES COMPANY

Large Firm Resources. Personal Attention.

LETTER OF TRANSMITTAL

TO: Michigan Department of Environmental
Quality

DATE: 05-13-15

525 W. Allegan (Constitution Hall 4th Floor)
Lansing, MI 48909-7742

JOB NO.: 14C0259

RE: Permit Application

Attn: Mike Prysby, P.E.

Shipped via: ☐ By 10:30am next business day

☐ By end of next business day

☒ Standard delivery

cc:

If shipping via UPS please provide Recipient's Phone No. 517-290-8817

WE ARE SENDING YOU:

☐ Attached ☐ Under separate cover via _____

COPIES	DATE	NO	DESCRIPTION
3	04-17-15	29	City of Flint 24"- Water Main Replacement full set of plans, sealed and signed
1	05-12-15	5	Permit Application For Water Supply Systems (plus attachment sheet)
1	04-29-15	21	Special Provision for Alteration of Municipal Water System

THESE ARE TRANSMITTED:

☒ For your use ☐ As requested ☐ Other: _____

REMARKS:

Mike,

Attached are the plans and specifications for Contract 2 of the 24" Watermain Replacement in the City of Flint (1.5 miles total). The permit application is also included. If you have any questions just call (810-341-7500) or send me an e-mail (dsanders@rowepsc.com).

Thanks,

DEQ
RESOURCE MANAGEMENT DIVISION

MAY 18 2015

LANSING DISTRICT

Signed: _____

Deveron Q. Sanders, P.E.
Project Engineer

This communication contains privileged or confidential information intended exclusively for the use of the Person(s) or Entity named above. If the reader of this cover page is not the intended Recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please telephone (collect) the Sender immediately. Thank you very much.

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Corporate: The ROWE Building, 540 S. Saginaw Street, Ste. 200; P.O. Box 3748 • Flint, MI 48502 • O (810) 341-7500 • F (810) 341-7573
With Offices In: Lapeer, MI • Mt. Pleasant, MI • Grayling, MI • Tri-Cities, MI • Myrtle Beach, SC

www.rowepsc.com

CITY OF FLINT
SPECIAL PROVISION
FOR
ALTERATION OF MUNICIPAL WATER SYSTEM



ROWE: COF

1 of 21

Description

This special provision replaces section 823 of the 2012 Michigan Department of Transportation Standard Specifications for Construction. This work shall consist of installing ductile iron watermain of the nominal diameter shown on the plans. This work includes the furnishing of all labor, equipment, and materials including shop drawings, required for excavation, installation, and backfilling as shown on the plans and specified herein.

1. Grades

All mains are to be laid with a minimum cover of five and 1/2 (5.5) feet unless otherwise shown on plans. This cover is to be from finish grade of the street. All mains are to be laid with a minimum cover of (6) feet under railroad track.

2. Miscellaneous Services from the City/Contractor

The Contractor shall notify the Engineer in writing, with copy of notification to City of Flint Water Service Center Supervisor, a minimum of four full working days prior to work requiring involvement of City of Flint Water Service Center personnel. The Contractor shall coordinate all activity related to watermain construction with the City of Flint Water Service Center personnel.

The City will furnish water for filling the mains for testing purposes. Water will be made available at connections of new mains to existing mains, or at existing fire hydrants. All connections shall be made in a manner and under conditions meeting the approval of the Water Distribution Supervisor. No charge will be made of the Contractor by the City for the use of water for testing purposes. All necessary attachments, devices and pumping for the proper use of such water are to be furnished by the Contractor at his expense, and shall be subject to the approval of the Water Distribution Supervisor.

The City will chlorinate or otherwise disinfect the watermains. The Contractor will furnish all tapping valves with sleeves, corporations for chlorination, pressure testing and water services. Contractor will perform all excavation, backfill, compaction, preparation and restoration of the site. The contractor will perform pressure test and will be responsible for installation of necessary taps for pressure testing and chlorination. The City of Flint will be responsible for installation of all pressure taps for water services. Contractor shall coordinate the installation provided by the City with City personnel. Contractor shall notify City personnel one week in advance of service and update status as requested.

The Contactor will make all connections and pressure taps to the existing watermain. All connections will be inspected and coordinated with the City of Flint Water Department Supervisor and/or Forman. Contractor will perform all excavation, backfill, compaction, preparation and restoration of the site. The Contractor will supply all parts and valves to make connections to existing mains as noted on the plans.

The Contractor will remove, salvage and deliver all existing hydrants to the City of Flint (location to be determined at the preconstruction meeting).

City personnel will perform installation of all service connections from corporation including curb stop and box. Installation of corporations and connections to the existing services (materials provided by Contractor) will be by City of Flint personnel. This work will include all labor by City of Flint personnel to install corporations to the existing and proposed watermain and connect existing service leads. Contractor will perform all excavation, backfill, compaction, preparation and restoration of the site.

3. Storing Materials and Supplies

Materials and supplies, if necessary, may be placed adjacent to the improvement, but ample way for foot traffic must at all times be maintained free from obstruction except with the express permission of the Water Distribution Supervisor. Any damage to the walks or property by reason of such storing of materials must be repaired by the Contractor at his own expense. The Contractor must not (*except after consent from the proper parties*) enter or occupy with men, tools, or materials any land not the property of the City, or land on which an easement or right has not been secured by the City.

4. Convenience to Public

During the progress of the work, the convenience of the public and of residents along the street must be provided for as far as practicable. Convenient access to driveways, houses and buildings along the street must be maintained wherever possible. The sidewalk or crosswalk shall be replaced, after backfilling of the watermain, as noted on the plans.

All traffic control and detouring of the streets will be done according to the plans and as specified in the **Special Provision for Maintaining Traffic**.

5. Structures Above Ground

Existing structures above ground such as utility poles, street lighting standards, parking meter supports, hydrants and the like and buildings shall be protected from damage. The Contractor shall be responsible for damage to any structures or fixtures above ground caused by his operations. The Contractor shall also be responsible for damage to existing underground structures caused by his operations as previously specified herein.

6. Fire Hydrants

No material or other obstruction shall be placed within ten feet of existing fire hydrants. *Hydrants shall at all times be readily accessible to the Fire Department.*

7. Rights-of-Way

In general, work under contract that is located in City streets or on City property. Rights-of-way across private property, where required, will be secured by the City without expenses to the Contractor. The Contractor shall hold himself strictly within the rights secured to him by the City in prosecuting the work on private property.

8. Use of Mains before Final Completion

The City shall have the right to make use of such portions of completed acceptably tested mains, during the construction period as they may find practicable. Such use by the City shall not relieve the Contractor from responsibility for any leaks or defective work in such mains and accessories which may develop prior to the final acceptance of all work under this contract.

9. Trees, Shrubs, Etc.

Trees, shrubs, etc., in the line of the watermain, will be removed, as noted on the plans.

Materials

1. Concrete

Class A - (*for all structures*)

1: 2: 6: Mix (*Minimum cement per cubic yard of concrete - 1.55 lbs*)

Class B - (*Lean concrete for fill*)

1: 3: 3: Mix (*Minimum cement per cubic yard of concrete - 1.10 lbs*)

All "Class A" concrete shall show a minimum 28 day strength of 3,500 pounds per square inch, and "Class B" concrete, 1,000 pounds, per square inch.

The retempering of concrete which has partly hardened, that is, remixing with or without additional cement, aggregate or water, will not be permitted.

Transit mixed concrete may be used.

In order to obtain clean and firm bearing surfaces, all water and softened material shall be removed from excavations immediately before concrete is deposited. Concrete shall not be deposited in water nor shall water be allowed to rise over the concrete until it has hardened sufficiently to prevent injury thereto. Any flow of water into the excavation shall be diverted through proper side drains to a pump, or by lowering the ground water level by means of pumps or removed by other approved means, which will avoid washing the freshly deposited concrete.

Concrete shall be deposited in accordance with approved practice and in a manner and under conditions which will meet the approval of the Engineer.

The surface of concrete and mortar that will be exposed to the sun or to premature drying after placing shall be kept constantly moist by sprinkling at frequent intervals; or by covering with moist burlap or canvas or by other means equally effective, for a period of seven (7) days after completion. Freshly finished surfaces shall be protected by supported canvas or other protection during rain or storms. A sufficient quantity of canvas or other protection shall be kept ready for this purpose.

2. Reinforcing Steel

Reinforcement steel shall conform to standard specifications for billet bars for concrete reinforcement, intermediate grade, serial designation A15-39 of American Society for Testing Materials.

3. Water Valve Manholes

Gatewells (gate valve in manhole) and well structures (check valve in manhole) materials shall be in accordance with Section 403 of the 2012 MDOT Standard Specifications for Construction or in accordance with the Standard Details. All valve manhole frames and covers shall be as specified on the Drawings.

An exterior seal of Wrapid Seal or a City of Flint approved alternate shall be installed to seal all valve manholes. Outside of road right-of-ways, Contractor shall use a City of Flint or Engineer approved one and one-quarter inch (1¼") pre-formed butyl rubber sealant between grade rings, valve manhole frames and valve manhole sections. Within road right-of-ways, Contractor shall use mortar between grade rings, valve manhole frames and valve manhole sections.

All tapping valves shall be installed in valve manholes. All valves, 12 inches and larger, installed in paved areas shall be installed in valve manholes to manhole frames. All structures shall be at grade when installed under paved areas or at six inches (6") below grade when installed under gravel roads.

The top of the valve manhole frames and covers shall be installed flush with finished pavement grade, finished lawn grade or six inches (6") below road grade in gravel roads.

Openings for watermain pipe inlets or outlets shall be provided in pre-cast units at the locations required and shall be true to form and approximately one inch (1") larger in diameter than the outside of the watermain pipe to provide for a mortar seal. The openings around all watermain pipe shall be completely sealed using non-shrink cement mortar grout.

Water valve manholes shall be constructed of pre-cast concrete and shall conform to ASTM C478-03 and contain a modified joint and premium rubber gasket which shall conform to ASTM C443-02. Valve manhole sections shall be installed on eight inch (8") thick pre-cast base slabs or installed integrally with the slab section. The valve manhole size shall be determined in accordance with the table provided on the watermain detail sheet.

4. Manhole Steps

All manhole steps shall be copolymer polypropylene plastic and installed in valve manholes at a spacing of sixteen inches (16") on center. All Copolymer polypropylene steps shall be M.A. Industries PS-1-PF, American Step Co. ML-10 with one-half inch (½") grade 60 steel reinforcement or a City of Flint approved alternate.

5. Pipe

Pipe used in the water distribution system shall be ductile iron pipe centrifugally cast in metal or sand-lined molds conforming to ANSI/AWWA C150/A21.50 and ANSI/AWWA

C151/A21.51 as amended to date. Push-on joints, mechanical joints, and/or restrained joints shall conform to ANSI/AWWA C104/A21.4 as amended to date.

<u>DIAMETER</u>	<u>DESIGNATION</u>	<u>THICKNESS</u>
4-inch	Class 54	.35-inch
6-inch	Class 54	.37-inch
8-inch	Class 54	.39-inch
10-inch	Class 54	.41-inch
12-inch	Class 54	.43-inch
16-inch	Class 54	.46-inch
18-inch	Class 54	.47-inch
20-inch	Class 54	.48-inch
24-inch	Class 54	.50-inch

The metal thickness class, net weight of the pipe without lining, the nominal size, and the manufacturers identifying symbol shall be clearly marked on each length of pipe.

Types of pipe and pipe sizes larger than 12-inch shall be specified individually based upon the particular conditions of the specific project. The pipe shall have cement-mortar lining conforming to ANSI/AWWA C104/A21.4 as amended to date. The pipe shall have a push on joint with a single rubber gasket and shall include brass or bronze wedges to permit electrical thawing. Polywrap meeting ANSI/AWWA C105/A21.5-99 for 8 mil Linear Low Density polyethylene encasement is required to cover all underground watermain and appurtenances including service taps and excluding copper service lead tubing.

6. AWWA Body

RESILIENT - SEATED GATE VALVES

A. Scope

This specification covers iron-body resilient-seated gate valves with non-rising stems (NRS) from 3" to 12" nominal pipe size.

B. Specific Requirements

i. Standard

The valves covered by this specification shall be in conformance with requirements of the current AWWA Specification C515, Underwriters Laboratories Standards UL262 and Factory Mutual Standard 1130. The Ductile Iron Body, Bonnet, Seal Plate, and Wedge are manufactured from Iron conforming to ASTM A536. The epoxy coating shall be in accordance with ANSI/AWWA C550 and certified to NSF61. The wedge is fully rubber

encapsulated to meet ASTM D429 requirements. The following specifications also apply.

ii. General

Gate valves are to be FlowMaster® Resilient Wedge Gate Vales as manufactured by East Jordan Iron Works.

All valves shall be mechanical joint type with non-rising stems and O ring seal. Valves are to be placed in the vertical position and open to the right (*clockwise*). The valve interior shall be coated with an epoxy.

The manufacturer shall supply catalog data including illustrations and part schedules.

The manufacturer shall furnish the purchaser with an affidavit stating the valve and all materials used in its construction conform to the applicable requirements of this standard and the supplementary specifications and that all tests specified therein have been performed and met.

7. BUTTERFLY VALVES

A. Scope

This specification covers butterfly valves of the approved type.

B. Specific Requirements

i. Standard

All butterfly valves shall conform to the requirements of AWWA C504 in all respects, except as may be specifically modified herein.

ii. General

Butterfly valves are to be Dresser, Series 450 or Groundhog Series as manufactured by Henry Pratt Company.

Valve ends shall be suitable mechanical joint connections. Valve body shall be high-strength cast iron ASTM A126 Class B with 18-8 Type 304 stainless steel body seat. Valve vane shall be high-strength cast iron ASTM A48 Class 40, having rubber seat mechanically secured with an integral 18-8 stainless steel clamp ring and 18-8 stainless steel self-locked screws.

Rubber seat shall be a full-circle 360 degree seat not penetrated by the valve shaft. Valve shaft shall be one piece, extending full size through the entire valve and operator with no neck-down, keyways, or holes to weaken it. Valve shaft shall have 304 stainless steel journals rotating in reinforced teflon bearings. Valve shall have permanently set two-way thrust bearing. Packing shall be "triple-seal" rubber designed for permanent duty in underground service.

Valve operator shall be of the traveling-nut type, sealed, gasketed and lubricated for underground service. It shall be capable of withstanding an overload input

torque of 450 ft. lbs. at full-open or full-closed position without damage to the valve or valve operator. It shall be designed to resist submergence in water of 25 ft. head pressure.

Valve shall be capable of easy closure by one person using standard valve key, even under emergency line-break conditions as severe as those that may require a valve maximum opening torque requirement of as much as two times AWWA Class 150B.

All valves shall open to the right (*clockwise*) and be equipped with a 2" square AWWA operating nut.

The manufacturer shall supply catalog data including illustrations and part schedules.

The manufacturer shall furnish the purchaser with an affidavit stating the valve and all materials used in its construction conform to the applicable requirements of this standard and the supplementary specifications and that all tests specified therein have been performed and met.

8. CHECK VALVES

A. Scope

This specification covers check valves of the approved type.

B. Specific Requirements

i. Standard

The valves covered by this specification shall be in conformance with requirements of the current AWWA Specification and ANSI B16.1 Class 125 rated to a minimum of 250 psi.

ii. General

Check valves shall: be manufactured from gray cast iron meeting or exceeding ASTM A126 Grade B; comply with AWWA C508; allow for clear waterway opening; possess a ductile iron clapper arm conforming to ASTM A536 Grade 65-45-12; possess a disc which does not contact the body when the valve is in full-open position; possess a shaft which is stainless steel with corrosion resistant bearings.

Check valve brand shall be American Flow Control 50-SC swing check valve or approved equal.

9. TAPPING VALVES AND SLEEVES

A. Scope

This specification covers tapping valves and sleeves of the approved type.

B. Specific Requirements

i. Standard

The valves, hardware and sleeves covered by this specification shall be in conformance with requirements of the current AWWA Specification rated to a minimum of 250 psi.

ii. General

Tapping valves, hardware, sleeves and flanges shall be an approved type, as proposed by Shop Drawing submittal, as manufactured by East Jordan Iron Work for FlowMaster®. Sleeves, flanges, and hardware shall be stainless steel.

10. LEVEL CONTROL VALVES

A. Scope

This specification covers level control valves of the approved type.

B. Specific Requirements

i. Standard

The valves, hardware and sleeves covered by this specification shall be in conformance with requirements of the current AWWA Specification rated to a minimum of 250 psi.

ii. General

Level control valves are to be Singer Valve model 106-A-Type 3 / 206-A-Type 3, as manufactured by Singer Valve Company.

Valve ends shall be suitable for flange connections. Both the Model 301-4 Pilot spring range (elevation) and Model 625-RPD differential (delayed opening) set-point preset's are to be set by Singer Valve. The City Engineer will be provided ranges prior to Contractor purchasing/ordering the valve.

11. IN LINE STOPS

A. Scope

This specification covers in line stops of the approved type.

B. Specific Requirements

i. Standard

The valves covered by this specification shall be in conformance with approved standards as determined by the City of Flint and the Engineer.

ii. General

In line stops are to be the approved type and manufacturer, as proposed by Shop Drawing submittal.

12. Hydrants

A. Scope

This specification covers post-type dry-barrel hydrants.

B. Specific Requirements

i. Standard

The hydrants covered by this specification shall be in conformance with requirements of the current ANSI/AWWA Standard C502 with revisions to date. Hydrants also shall be Underwriters Laboratories Standard UL246 listed and Factory Mutual 1510 approved, The Ductile Iron castings shall be manufactured from iron conforming to ASTM A536, and the following supplemental specifications.

ii. General

Hydrants are to be East Jordan Iron Works Model 5BR250, part #55512D.

Hydrants are to be of the *"Breakable"* or *"Traffic Type"* with replaceable components of barrel and stem. The hydrants shall be compression type shut-off which will remain closed in event of accidental damage or breaking of the barrel. The seat valve shall be bronze to bronze material.

Hydrants are to have 5-1/4" inch main valve and 6-inch side inlet. Inlet to have mechanical joint unless otherwise specified on bid sheet. The hydrants shall be provided with a drain or waste outlet which is part of the main valve mechanism; at delivery the drain or waste outlet is to be tapped and plugged.

Hydrants are to have "O" ring packing. The hydrant shall be painted chrome yellow. The top of hydrants shall be painted according to the standard detail sheet in the plans. Hydrants will open to right (clockwise) and the direction of opening shall be clearly shown by an arrow and word *"open"* cast in relief, so as to be clearly visible on the top of the hydrant. Hydrants shall have two 2 1/2 inch hose nozzles and one 4 1/2 inch pumper nozzle with NST threads and caps with chains. Operating and cap nuts are to be square. The square is to measure 7/8 inches across the flats at the base and not less than 3/4 inches at the top. Height of the nut is not to be less than one inch.

Mechanical joint hydrants are to include joining material. Hydrants shall be designed so that extensions to the barrel may be added above ground without excavation. Hydrant design shall be such that no excavation is necessary to remove the main stem and the movable parts of the drain valve.

Trench Details are as noted on the plan sheets. The standard depth of bury (DOB) for a hydrant is 6'0" unless otherwise noted on plans. The Contractor will salvage and deliver to the City all existing hydrants. The hydrants shall be painted as noted in the plans (detail sheet).

13. Fittings

A. Scope

This specification covers ductile iron fittings 3 - 48 in. for water.

B. Specific Requirements

i. Standard

The fittings covered by this specification shall be in conformance with requirements of the current AWWA Standard C 153/A21.53 and C 111/A 21.11 and the following supplemental specifications.

ii. General

All fittings are to be mechanical joint, cement lined, with a 350 psi pressure rating. When requested, fittings should be supplied to fit over both centrifugally cast and sand cast pipe.

Mechanical joint fittings are to include joining material.

14. Gatewell Rings and Cover

Gatewell castings shall be East Jordan Iron Works No. 104018L01 with cover type "CF-6", or approved equal. Cover shall contain type "A" legend with the text "WATER" cast on it.

15. Valve Boxes

Valve boxes are to be the EJIW 95E, Bibby 95E, or Tyler 6500 Screw Type, 2-piece, arch pattern for services. Boxes for mains shall be EJIW 8560 series 3-piece with #6 base as specified. Gray Iron will conform to ASTM A48 Class 35B gray iron with cold tar asphaltic dip. Lids shall have the word "water" cast into the lid.

16. Encasement Pipe

Steel pipe where specified for encasement pipe shall be new welded steel pipe and shall meet standards of ASTM 139, Grade B. The pipe shall be 1/4 (.250) inch to 13/32 (.406) inch wall thickness as specified on the plans and special provision if included in bid package.

17. Separator Skids

Skid runners that completely separate casing and carrier pipes shall be utilized. Methods and materials shall be approved by the Engineer.

Where hardwood runners are approved for banding to water carrier pipe, they shall be treated with pentachlorophenol-petroleum solution. The pentachlorophenol-petroleum solution shall consist of not less than 42 percent, nor more than 52 percent of pentachlorophenol dissolved in a heavy petroleum solvent. Then pentachlorophenol and the heavy petroleum solvents shall conform to the requirements of the current specifications for Timber preservatives, AASHTO Designation: M133.

Pentachlorophenol-petroleum solution may be purchased as a ready-to-use product, or a concentrate to be diluted with the petroleum solvent.

The wood may be pressure treated or may be immersed in the specified pentachlorophenol-petroleum for a period of at least seven days.

18. Mechanical Joint Restraints

When circumstances dictate and approved by the Water Distribution Supervisor, Megalugs shall be used in conjunction with thrust blocks as additional joint restraint.

A Megalug Restraining Harness shall be constructed of ductile iron with steel set screws. Set screws shall be tightened to the torque recommended by the manufacturer. Ductile iron Megalugs shall be by EBAA Iron.

If approved by the Water Distribution Supervisor, tie rods and duc-lugs may be used in lieu of Megalug Restraining Harness.

Tie rods shall be ¾-inch minimum diameter, threaded and zinc plated. The number of rods in the joint restraint shall be as recommended by the manufacturer. Tie rods shall be connected through duc-lugs or eye-bolds and shall be double bolted. Eye bolts and duc-lugs shall be constructed of high strength, low alloy steel, or ductile iron. A protective coating of Koppers 50, 505, or equal shall be applied to all tie rods, nuts, bolts, and duc-lugs.

Mechanically restrained joints are considered included in work of watermain construction and will not be paid for separately.

19. Corporations and Curb Stops and Saddles shall be approved Ford type or similar approved.

Detailed Specifications

1. Scope

Under this item, the Contractor will furnish all labor, pipe, valves, fittings, valve boxes, hydrants, manholes including rings and covers, service leads and any other material necessary for a complete main laying job. All materials and workmanship shall be as approved by the Engineer and City of Flint Water Service Center Distribution Supervisor.

2. Excavation

The locations of existing utilities are shown in accordance with available data. The Contractor shall expose those utilities where required, to determine actual locations. The Contractor shall not disturb nor cut into any existing watermains in service without City of Flint Water Distribution Supervisor's approval.

The Contractor shall explore the street far enough in advance of laying pipe to check exact locations of underground structures, sewers, watermains, services, also gas and electric structures. The Contractor shall contact the Engineer if any adjustments to plan and profile of new watermains are needed to avoid interference with existing structures,

and the Contractor shall be responsible for all unnecessary injury to underground structures in the course of his operations.

Trenches for mains shall be excavated so that there will be a minimum net clearance of twelve inches on each side of the barrel of the pipe. Watermain trenches shall be excavated to the lines, grade, and cross-section shown on the plans or to such modifications as may be approved Water Distribution Supervisor, or Engineer to meet or pass existing utility structures. Foreign materials encountered in the trench, such as slabs of wood, boulders, and the like, which obstruct the trench shall be removed with other excavation and where such obstructions occur, at or near the bottom of the trench, requiring excavation below the standard grade. Unnecessary excavation below grade by the Contractor shall be refilled to grade with tamped sand. Excess excavated materials not required in backfilling shall be removed and disposed of by the Contractor. The trench shall be brought back to grade by 1) backfilling to bottom of proposed aggregate base with approved sand meeting the requirements for MDOT Class II granular Material, compacted to 95% of its maximum unit weight at optimum moisture content, and 2) placement of aggregate base as called for on the plans or, as a minimum, place 8 inches minimum depth of 100% crushed limestone meeting the requirements for MDOT dense graded aggregate 21AA, compacted to 98% of its maximum unit weight at optimum moisture content,

Where condition of the ground requires, the sides of trenches shall be securely held by bracing sheeting which may be removed in units when the level of the backfill has reached dept where it is safe to pull the sheeting. No sheeting, bracing or other timber shall be left in the trench upon completion of the main or other structure.

The Contractor is required to control the infiltration of groundwater into the excavation. If ordinary methods of drainage such as bailing, pumping, etc., prove unsatisfactory, the Contractor is responsible for dewatering.

The bottom of the trench shall be shaped so as to conform as nearly as possible to the outside of the pipe, particular care being taken to recess the bottom of the trench in such manner to relieve the bell of all load.

Where trench must be cut through pavement, driveway, or walk, particular care shall be taken to unnecessarily damage adjoining areas of pavement, driveway or walk. Cuts are to be made with a smooth edge by use of a concrete saw.

Other underground mains, sewers or structures encountered in the excavation shall be adequately supported during the Contractor's operations, and before backfilling of the trench, shall receive a permanent support of lean concrete (*Class B*), extending from the bottom of the trench to the underside of the main or other structure. In lieu of such concrete pedestal support, other approved support may be used satisfactory to the Water Distribution Supervisor.

Small pipes and services encountered in the excavation shall, where deemed necessary by the Water Distribution Supervisor, be properly supported and protected from possible damage by lean concrete (*Class B*) or timber beams of adequate strength extending across the trench into undisturbed ground or by concrete pedestals extending to the bottom of the trench, or by other approved method.

3. Laying Pipe and Fittings

In handling or laying pipe, no metal shall be allowed to come in contact with the inside of the pipe. Care shall be taken not to damage the pipe or pipe coating and no damaged or imperfect pipe may be used in the work. Minor damage to pipe coating may be repaired subject to the approval of the Water Distribution Supervisor.

Pipe shall be carefully laid in the dry and to line and grade and care shall be taken to keep the interior of the pipe clean and free from dirt and other foreign materials. Rubber gasket plugs or approved bulkhead shall be used for this purpose. Mechanical joint pipe fittings shall be jointed with the bolts, gaskets and follower rings furnished by the pipe manufacturer, and the procedure in making such joints shall be in accordance with manufacturer's instructions and recommendations.

All in line bends, fitting, tees, solid sleeves, reducers, and hydrants shall be encased in 8 mil polyethylene. The polyethylene film tube shall be installed in accordance with ANSI/AWWA C 105/A21.5, Method A. Method A consists of cutting the polyethylene tube 2 feet longer than the pipe to provide an overlap at the joints.

Single-rubber-gasket joint pipe shall be installed according to the manufacturer's instructions and recommendations and is to have the required number of brass wedges installed at all joints for electrical thawing.

At crossings, one (1) full length of water pipe shall be located so both joints will be as far from the sewer crossing as possible, see crossing detail #SD-17W.

4. Backfilling

The Contractor shall backfill the trench according to MDOT Standard Plan R-83(Series), Trench Detail G. This Detail utilizes MDOT class II or IIA granular material, thoroughly tamped in not to exceed twelve (12) inch layers and compacted to 95% of its maximum density. Material excavated from trench shall not be left on the roadway, but shall be trucked away or deposited on the adjoining property if approved by owners of said property. The roadway shall be kept clear at all times of excavated material. Caved material shall be dug out of the trench in the same manner and the entire excavation backfilled with sand as specified above.

Where gravel surfacing in graveled streets, roads or driveways is excavated, in work under this contract, such gravel surfacing shall be replaced over the disturbed area to the original depth and grade and of material similar and equal to the original material.

Where hot mixed asphalt (HMA) is being placed, a minimum of 12 inches of crushed limestone aggregate base, meeting the requirements of MDOT dense graded aggregate 21AA, shall be placed and compacted to 98% of its maximum unit weight at optimum moisture content, in preparation for the HMA pavement per plans.

Where concrete curbs or sidewalks or private driveways are disturbed, damaged, or cut through by the Contractor for work under this contract, such curbs and sidewalks or driveways shall be removed and replaced.

Except where plans call for payment of aggregate base by other means, payment for watermain will be made on the basis of excavation and backfill as herein specified and no claims for extras on these items will be allowed.

5. Testing Watermain

After the line is installed, it shall be pressure tested by the Contractor (witnessed by City of Flint Water Distribution personnel) for two (2) hours at 150 psi. Allowable leakage will be calculated by using the formula-

Allowable leakage is:

$0.092 \text{ GPH} \times \text{LENGTH OF PIPE (IN FEET)} \times \text{NOMINAL DIAMETER (INCHES)} / 1000 \text{ FT}$
@ 150 PSI TEST PRESSURE

Chlorination shall be completed in accordance to AWWA C650, pressure testing shall be accordance with AWWA C600-05 and disinfection shall be per AWWA C651-99. Chlorination and disinfection of new mains laid under this contract will be performed by the City soon after testing and if feasible, in connection with flushing of the main. The chlorinated water shall be drained out of the pipe line by the Contractor and he shall be responsible for repair of any erosion or damage resulting from this operation. If, during the filling, testing or disinfection of any section of main, turbidity appears in the samples or if it becomes impossible to obtain a sterile sample by chlorination, the Contractor shall remove, at his own expense, the source of the turbidity or contamination, by flushing and/or draining, entering, digging up, and cleaning, to the end that it may be possible to obtain a clear sterile water from the main.

Bacteriological testing shall include two (2) consecutive safe bacteriological samples, obtained at least 24 hours apart for each run of pipe, not to exceed 1,200 feet.

6. Valves

A. Installation

Gate valves up to and including 12" shall be placed in a vertical position and all sizes above 12" shall be placed horizontally in the line. Care shall be taken that the spindle of a vertical valve is vertical and that horizontal valves have the shaft of the driving pinion in a vertical position.

All 12" and larger Valves which are located in the pavement shall have valve manholes (*Gatewells*). 6" and 8" gate valves shall have valve boxes with covers flush with the ground/pavement unless otherwise called for in the plans.

Check valves in well structures shall be installed per manufacturer's specifications, per plan details and as directed by the Engineer.

Tapping valves and sleeves shall be installed by approved installers per manufacturer's specifications and as directed by the Engineer.

In line stops shall be installed by approved installers per manufacturer's specifications and as directed by the Engineer. The work of In Line Stop of the valve size specified shall consist of installation and removal of in-line valve apparatus, capable of stopping flow in a watermain under pressure, of the size specified commensurate to the diameter of the watermain to which flow is to be stopped, at

locations directed by the Engineer, and includes all work for excavation, concrete pad construction, In Line Stop installation and removal, and backfilling with select fill CIP, meeting the requirements of Granular Material Class II compacted to not less than 95% of its maximum unit weight in 12 inch maximum lifts. This work shall include excavation of an 8' x 8' minimum hole as preparation for the In Line Stop. Traffic control and pavement removal and replacement is not included and shall be paid for separately. Providing materials, labor, and equipment for concrete for each In Line Stop, a minimum of 2' in depth and 6' by 6' in horizontal dimension is included in this work. The concrete shall have a minimum strength of 2000 psi prior to placement of any In Line Stop apparatus.

Contractor is to provide the control valve, and all necessary materials and equipment to aid the City of Flint personnel with the removal and replacement of the valve.

B. Valve Manholes (*Gatewells*)

Gatewells (gate valve in manhole) and well structures (check valve in manhole) shall be built in accordance with the details and at the locations shown on the plans and in accordance with the applicable portions of Section 403 of the MDOT Standard Specification, and as specified in this Special Provision.

Manhole bottoms shall be of "Class A" concrete floated smooth. Sidewalls shall be of brick or manhole blocks. Brick or block shall be laid with the long dimension radially in the manhole. Every brick or block shall have full mortar joints on the bottom and sides, which shall be formed at one operation by placing sufficient mortar on the bed and forcing the brick or block into it. Horizontal joints shall not exceed 3/4" except for exterior joints in the domed portion of the manhole and the vertical joints on the inside of the manhole are built up. Brick or block manholes shall be plastered on the outside with a 2" coat of mortar. Mortar used for masonry work shall only be mixed in quantities which are immediately useable. Any mortar which is set sufficiently to require retempering shall not be used. When the manhole is completed, cast iron ring and cover are to be set in place to line and grade.

If the Contractor is approved to use precast manholes, the *Gatewell* shall be in accordance with Section 403 of the MDOT Standard Specifications, and as shown on the plans. Where Contractor is approved to use precast manhole components, it shall be the Contractor's responsibility to order manhole components with proper pipe hole location and orientation and Contractor accepts all costs for re-ordering new components and disposition of unacceptable components.

7. Fire Hydrants

A. Scope

Under this item, the Contractor shall install fire hydrants as shown on the plans and specified herein.

B. Installation

Fire hydrants shall be installed with the barrel vertical and with base of hydrant head substantially at final grade. At the base of the barrel, of each hydrant, shall be placed not less than one cubic yard of coarse gravel to provide drainage and thrust blocks will be required if mechanical joint pipe and hydrant is used. Backfill shall be thoroughly tamped around hydrant barrel for its entire depth below ground.

8. Concrete Thrust Block, Encasement & Mechanical Restraints

A. Scope

Under this item the Contractor shall furnish all labor, materials, tools and equipment for all concrete thrust blocks at angles in the main or as otherwise shown on the plans, all concrete encasement of watermain required and for all retainer glands or anchoring fittings specified plans. Retainer glands are not to be used on cast iron pipe.

B. Materials

Concrete materials, reinforcing steel and concrete shall conform to the plans and as specified herein. All concrete used under this item shall be "Class A" concrete.

C. Thrust Blocks

At all tees, bends and ends of main, or as otherwise shown on the plans, a "Class A" concrete thrust block shall be placed between the side or end of the pipe or fitting and DDE extending to the undisturbed side or end of the trench as the case may be to take up thrust in the line. Thrust blocks shall be City standard as shown on plan sheets or approved equal.

When special conditions are encountered in which concrete thrust blocks do not give adequate protection to the installation, in the opinion of the Water Distribution Supervisor, mechanical restraint shall be installed. No claims for extras will be allowed when mechanical restraints are specified. Concrete thrust blocks will be installed in all cases in addition to the mechanical restraints where specified.

D. Mechanical Restraints

Where specified on the plans, mechanical restraints shall be used in lieu of concrete thrust blocks.

9. Maintenance of Trenches

A. Scope

It is the intention of these specifications that street right-of-way surfaces shall be replaced and left in the same (or better) condition as before excavation was made. Where excavation has been made in an established lawn area, the Contractor will be required to grade, reseed with a perennial grass seed, and cover with straw, after a reasonable time has been allowed for settlement and maintenance of the trench. All proposed upgrades to the roadway are outlined on the plans.

10. Service Lines

A. Scope

Service leads to existing and buildings shall be Type K Copper. The sand backfill (when under the influence of the roadway) will be compacted to 95% of the Maximum density. The Contractor is to provide all Type K Copper, curb stop, and box. Contractor is to provide all corporations (installed by City of Flint). City of Flint personnel will make all connections to existing service lines. Exact locations of

services shall be located in the field as supervised by the Water Distribution Supervisor. Service lines shall be perpendicular to buildings and main having no curves between building and main.

Trenchless installation of water services using push bores, directional drilled, and other approved methods shall use standard, approved construction methods. The Contractor shall submit a boring plan detailing equipment, materials and procedure to be used prior to beginning work. The Contractor shall be responsible for locating any existing utilities in the bore route for the new service lead ensuring no damage to existing utilities. Contractor will be responsible for approved repair to any damaged utility facilities at no additional cost to the contract.

11. Filling Abandoned Structures and Main with Flowable Fill

A. Scope

The abandoned structures, vaults, and watermain shall be *completely* filled with flowable fill (lean cementitious grout) unless specified for removal and as directed by the Engineer. This shall take place once the old watermain is completely out of service. The Contractor shall utilize enough points to inject the flowable fill into the abandoned watermain to *completely* fill it for the entire length of the project, or as directed by the Engineer. Furnishing, installing and, if necessary, removal of all fittings, standpipes, caps and work necessary to completely fill abandoned structures and main are included in payment for Flowable Fill.

12. Miscellaneous Pipe Repair

B. Scope

When an existing sewer pipe, drain pipe, field tile or other existing pipe is damaged as a result of construction activities and is not designated for removal or abandonment on the plans or by the Engineer, it shall be repaired by the Contractor.

The section of damaged pipe shall be removed to existing joints or to sawed joints where the existing pipe is sound and undamaged. A length of new pipe of the same size as the original pipe shall be furnished and installed to replace the section of pipe removed. The new pipe may be any one of the following materials:

- o Same material, class or thicknesses, as the original pipe
- o PVC Schedule 40, for pipes 8 inches or less in diameter
- o PVC DR 26, for pipes 8 inches or greater in diameter
- o Other pipe material approved by the Engineer

Each end of the new section of pipe shall be connected to the remaining sections of existing pipe using a rubber gasketed sleeve, suitable for the pipe materials and sizes being joined, to provide a watertight connection. The repaired section of pipe shall be firmly bedded in sand or stone, compacted to at least 95% of its maximum unit weight.

Measurement And Payment

The work of constructing watermain will be paid for at the contract unit price for the actual quantity of each of the following pay items actually constructed.

<u>Pay Item</u>	<u>Pay Unit</u>
Aban Gatewell.....	Each
Rem Hyd Asmbly	Each
Rem Gatewell	Each
Rem WM	Foot
Hydrant, Adj	Each
Curb Box, Adj	Each
Gate Box, Adj, Special	Each
Rem Valve Box	Each
WM, DI, ____ inch, TD F	Foot
WM, DI, ____ inch, TD G	Foot
Connect To Existing	Each
WM Bend, 24 inch, Field Fit	Each
In Line Stop, ____ inch	Each
Hyd Asmbly	Each
GV and Well, ____ inch	Each
BFV and Well, ____ inch	Each
GV and Box, ____ inch	Each
Level Control Valve, ____ inch	Each
WS, ____ inch, Open Cut	Foot
WS, ____ inch, Bored	Foot
Curb Stop, Box and Corp	Each
Flowable Fill	Cyd
Pressure Testing	Lump Sum
Miscellaneous Pipe Repair	Each

Water service connections and/or pressure taps to the watermain. Installation of corporations, and connections to the existing services (materials for both provided by Contractor) will be by City of Flint personnel. This work will include all labor by City of Flint personnel to install corporations to the existing and proposed watermain. All material and equipment necessary to excavate and restore the area will be the responsibility of the Contractor and included in the contract unit prices bid for the effected pay items and will not be paid for separately.

Dewatering operations(trench and/or pipe) associated with **Alterations to the Municipal Water System** will not be paid for separately, but will be included in the contract unit prices bid for the effected pay items.

The cost of excavation, disposal of excess material, and furnishing, placing, and compacting the backfill, will be considered as included in the contract unit prices bid for the effected pay items.

WM, DI, ____ inch, TD F and WM, DI, ____ inch, TD G of the sizes specified, will be measured in place per *foot* along the centerline of the pipe, with no deductions for fittings. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the work specified herein and as shown on the plans, including inspection/watermain connection fees paid to the City of Flint Water Service Center, furnishing and installing all appurtenances, tees, temporary and permanent plugs, oversize solid mechanical joint sleeves, fittings, reducers, gaskets, polyethylene encasement, knocking down existing water boxes, thrust blocks, bracing or sheeting, and all other miscellaneous items necessary for the installation of pipe and reconnection to the Municipal Water System as described in the plans. Payment for all material, labor and equipment necessary to remedy an unsatisfactory

hydrostatic test, including removing and replacing any backfill, shall be considered as included in the contract unit price for **WM, DI, ____ inch, TD F and WM, DI, ____ inch, TD G.**

WM Bend, ____ inch, Field Fit of the diameter specified, of any nominal angle, will be measured in place per *each* ductile iron angle fitting utilized to re-route watermain due to unforeseen field fit conditions. This item shall not be used for routing watermain by design as shown on the plans.

Connect To Existing watermains will be measured in units of each, for each connection to an existing main, other than connections made with a cutting-in tee or with a pressure connection. This work includes furnishing and installing all necessary fittings to connect to an existing watermain in addition to work and materials to cut and cap existing mains with approved methods and materials. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the work specified herein and as shown on the plans. There will be no adjustment in price based upon the size or material of the pipes. All material and equipment necessary to excavate and restore the area will be the responsibility of the Contractor and included in other pay items.

WS, ____ inch, Open Cut of the sizes specified will be measured in place per *foot* along the center of the trenched in Type K copper tubing. **WS, ____ inch, DI, Open Cut** of the sizes specified will be measured in place per *foot* along the center of the trenched in ductile iron service lead. **WS, ____ inch, Bored** of the sizes specified will be measured in place per *foot* along the center of the bored length of water service lead of any material type. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the work specified herein and as shown on the plans. The sand backfill (when under the influence of the roadway) will be compacted to 95% of the Maximum density. When in pavement areas, 21AA crushed limestone subbase, 8 inch minimum depth, will be compacted to 98% of the Maximum density. The cost for excavating for the curb box, placing curb box & curb stop, furnishing corporations and coordination/connection fees with City of Flint forces on placing corporations and connection to existing leads will be included in the pay item for **Curb Stop, Box and Corp.** Locations of services shall be supervised in the field by the Water Distribution Supervisor. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the work.

GV and Box, ____ inch of the type and size specified, will be paid for at the contract unit price *Each*, which price shall be payment in full for furnishing and installing the valve box complete and ready for use. Contractor shall remove, salvage and stockpile at an approved on-site location all existing valve boxes paid for as **Rem Valve Box** which will be paid for at the contract unit price per *Each* existing 3-piece (or similar) valve box unit salvaged and stockpiled including all labor and equipment to complete the work.

GV and Well, ____ inch of the valve size specified with associated gatewell diameter per plan details, will include furnishing and installing the gate valve and gatewell as specified. The Contractor will be required to provide oversize valves as specified in the plans, and will not be paid *extra* for this. The gatewell cover castings shall be measured and paid for separately. The valve and gatewell will be considered one unit, and paid as *Each*.

BFV and Well, ____ inch of the valve size specified with associated gatewell diameter per plan details, will include furnishing and installing the butterfly valve and gatewell as specified. The Contractor will be required to provide oversize valves as specified in the plans, and will not be paid *extra* for this. The gatewell cover castings shall be measured and paid for separately. The valve and gatewell will be considered one unit, and paid as *Each*.

CV and Well, ___inch of the valve size specified with associated well structure diameter per plan details, will include furnishing and installing the check valve and well as specified. The Contractor will be required to provide oversize valves as specified in the plans, and will not be paid *extra* for this. The well structure cover castings shall be measured and paid for separately. The valve and well will be considered one unit, and paid as *Each*.

TV and Well, ___X___ inch of the tapping tee, valve, and sleeve size specified with associated gateway diameter per plan details, will include furnishing and installing the tapping tee, valve, sleeve, and gateway as specified, except that the City of Flint personnel will supervise or perform the tap. The gateway cover castings shall be measured and paid for separately. The tapping tee, valve, sleeve and gateway will be considered one unit, and paid as *Each*.

Hyd Asmbly will be paid for at the contract unit price, *Each*, which price shall be payment in full for furnishing and installing the hydrant and valve assembly, including connection to and pipe from the main regardless of length, complete and ready for use at the locations shown on the plans. Contractor shall remove, salvage and deliver to the City all existing hydrants paid for as **Rem Hyd Asmbly**.

Pressure Testing will be paid for as a *Lump Sum*. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the pressure test procedure and also setting up the watermain for chlorination (equipment provided by Contractor). City of Flint Water personnel will perform the Chlorination of the watermain. Additional time and labor required (call back time) for re-chlorination or additional testing oversight due to non-passing tests will be billed to the Contractor, at a rate of \$250 per instance.

Any required auxiliary valves (In Line Stop), or any other item for which separate items have been set up will be paid for separately.

Aban Gateway will be paid for at the contract unit price per *Each* gateway of any size abandoned in place by removing the structure to a minimum of two feet below proposed bottom of pavement subbase or finished grade when outside pavement and filling the structure with sand meeting the requirements of MDOT Class II Granular Material tamped and compacted to the Engineer's satisfaction. Payment shall include all labor, equipment and materials to complete this item of work.

Rem WM will be paid for at the contract unit price per *Foot* of watermain of any size or material type removed and disposed of off site. Removed material shall become the property of the Contractor to be properly disposed of. Payment includes all labor, equipment and disposal costs to complete this item of work.

Rem Gateway will be paid for at the contract unit price per *Each* gateway of any size or material type removed and disposed of off site. Removed material shall become the property of the Contractor to be properly disposed of. Payment includes all labor, equipment and disposal costs to complete this item of work.

Miscellaneous Pipe Repair includes all work necessary to repair existing sewer pipes, drain pipes, field tiles, or other existing pipes encountered and damaged by construction activities because their location was not identified or the existing pipes were not in sound condition. Payment for this work includes all labor, materials and equipment necessary to complete the appropriate repair including lost production time for performing other work. There will be no adjustment in the unit price for differing types of pipes, materials, classes or thicknesses or diameters. Existing utilities and pipes which are either shown on the drawings or located in the

field by MISS DIG or the utility agency are to be located and protected by the Contractor and, if damaged, will not be eligible for payment unless the Engineer determines that the original pipe was not in sound condition before construction.

Cutting and capping the existing watermain as necessary will be included in the watermain pay items listed above and will not be paid for separately. This work will included cutting and capping watermain of any size or material by approved methods and shall include saw cutting, fitting connection and cap fitting or plug of approved type.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS

(CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Environmental Quality (DEQ) Staff. See instructions below for completion of this application.

Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint Water Service Center 3310 E. Court Street Flint, MI 48506 WSSN: 2310	Permit Stamp Area (DEQ use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 151018 APR 3 2015 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976 MFP	
Owner's Contact Person (provide name for questions): Contact: Rob Bincsik Title: Supervisor of Water Distribution & Sewer Phone: (810)766-7202	4. Project Location (City, Village, Township): City of Flint	5. County (location of project): Genesee
Project Name (Provide phase number if project is segmented): 4-inch Water Main Replacement (contract/phase 1)		

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY

CC:

Issued by:

Michael Prybyl

Reviewed by:

Michael Prybyl

☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DEQ District Office having jurisdiction in the area of the proposed construction.

Please Note:

- a. This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- b. The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
- c. This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- d. Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- e. Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- f. All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- g. All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- h. Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- i. Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions **will be returned**. SEE EXAMPLES BELOW. Use additional sheets if needed.

8400 Feet of 24-inch water main from Pasadena Avenue and Iroquois Avenue, South, 20 blocks, along Iroquois Avenue from Pasadena Ave. to Stockdale St.

East, Jog of Approx. 100 feet, along Stockdale Street from Iroquois Ave. to Euclid Ave.

South, 1 block, along Euclid Avenue from Stockdale St. to Welch Blvd.

West, 1 block, along Welch Boulevard from Euclid Ave. to Seminole St.

South Southwest, 3 blocks, along Seminole Street from Welch Blvd. to DuPont St.

South, 10 blocks, along Dupont Street from Seminole St. to Mackin Road.

Water main is stubbed south of Mackin Road for future additions.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address:

Jeffrey B. Markstrom, P.E.
 ROWE Professional Services Company
 P.O. Box 3748
 Flint, MI 48502
 (810)341-7500 jmarkstrom@rowepsc.com

8. Indicate who will provide project construction inspection:

- ☐ Organization listed in Box 1.
☒ Engineering firm listed in Box 7.
☐ Other - name, address, and phone number listed below.

9. Is a basis of design attached?

☐ YES ☒ NO

If no, briefly explain why a basis of design is not needed.

10. Are sealed and signed engineering plans attached?

☒ YES ☐ NO

If no, briefly explain why engineering plans are not needed.

11. Are sealed and signed construction specifications attached?

☒ YES ☐ NO

If specifications are not attached, they need to be on file at DEQ.

12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed?

☒ YES ☐ NO

If no, explain which deviations were made and why.

13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved?

☒ YES ☐ NO

If no, describe what coatings, additives or materials did not meet the applicable standard and why.

14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement?

(For projects not located in the public right-of-way, utility easements must be shown on the plans.)

☒ YES ☐ NO

If no, explain how access will be obtained.

15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451?

☐ YES ☒ NO

If yes, a wetland permit must be obtained.

16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules?

☐ YES ☒ NO

If yes, a flood plain permit must be obtained.

17. Is the project construction activity within 500 feet of a lake, reservoir, or stream?

☒ YES ☐ NO

If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?

☐ YES ☒ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☐ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES ☒ NO

If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) City of Flint

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☒ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DEQ.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, Daugherty Johnson (name), acting as the Utilities Administrator (title/position) for
(print) (print)

City of Flint (entity owning proposed facilities) certify that this project has
(print)

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.

Daugherty Johnson
Signature*

3/20/15
Date

810 766-7135
Phone

*Original signature only, no photocopies will be accepted.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

PROJECT BASIS OF DESIGN – FOR WATER MAIN PROJECTS

PROJECT NAME: _____

For this PROJECT the following information must be provided per Act 399 unless waived by the Department. For projects other than water main installation, or if additional space is needed, attach separate sheet(s) with detailed Basis of Design calculations.

- A. A general map of the initial and ultimate service areas
☐ Included on engineering plans ☐ Attached separately
- B. Number of service connections served by this permit application _____
- C. Total number of service connections ultimately served by entire project _____
- D. Residential Equivalent Units (REUs) served by this permit application _____
- E. Total Residential Equivalent Units (REUs) ultimately served by entire project _____
- F. Water flow rates for proposed project based on REUs listed in "D" and "E" above
1. Initial design average day flow (mgd) _____
 2. Initial design maximum day flow (mgd) _____
 3. Total design average day flow (mgd) _____
 4. Total design maximum day flow (mgd) _____
 5. Required fire flows: ⁽¹⁾ _____ gpm for _____ hours
- G. Actual flows and pressures of existing system at the connection point(s) ⁽²⁾
- | | | | |
|-------|--------|-------|-----|
| _____ | gpm at | _____ | psi |
| _____ | gpm at | _____ | psi |
| _____ | gpm at | _____ | psi |
| _____ | gpm at | _____ | psi |
- H. Estimated minimum flows and pressures within the proposed water main system ⁽³⁾
- _____ gpm at _____ psi

(1) Every water system must decide what levels of fire fighting flows they wish to provide. Fire flow should be appropriate for the area (residential, commercial, industrial) being served by the project. Typical fire flow rates can be obtained from the water supply, local fire dept., ISO or AWWA. The water system must then be designed to be able to provide the required fire flows while maintaining at least 20 psi in all portions of the distribution system.

(2) Flows and pressures at the connection points must be given to determine if the existing water main(s) are able to deliver water to the new service area. These numbers can be obtained from a properly modeled and calibrated distribution system hydraulic analysis or hydrant flow tests performed in the field. If more than one connection is proposed, list as needed.

(3) List what the estimated minimum flows can be expected in the proposed water mains based on estimated water demands, head losses, elevation changes and other factors that may affect flows, such as dead end mains.



ROWE PROFESSIONAL SERVICES COMPANY

Large Firm Resources. Personal Attention.

LETTER OF TRANSMITTAL

TO: Michigan Department of Environmental
Quality

DATE: 01-9-15

525 W. Allegan (Constitution Hall 4th Floor)
Lansing, MI 48909-7742

JOB NO.: 14C0259

RE: Permit Application

Attn: Mike Prysby, P.E.

Shipped via: ☐ By 10:30am next business day

☐ By end of next business day

☒ Standard delivery

cc:

DEQ
RESOURCE MANAGEMENT DIVISION

JAN 13 2015

If shipping via UPS please
provide Recipient's Phone No.

WE ARE SENDING YOU:

☐ Attached

☐ Under separate cover via _____

COPIES	DATE	NO	DESCRIPTION
2	01-09-15	30	City of Flint 24"- Water Main Replacement full set of plans, sealed and signed
1	03-18-13	25	Copy of Permit #131020

THESE ARE TRANSMITTED:

☒ For your use

☐ As requested

☐ Other: _____

REMARKS:

Mike,

Attached are the final plans for the first 1.6 mile section of the previously permitted 24" main replacement in the City of Flint. We have highlighted this section of main proposed for construction on the attache permit. If you have any questions just call (810-341-7500) or send an e-mail (doparka@rowepsc.com).

Thanks,

Signed: _____

Dean A. Oparka, P.E.
Sr. Project Engineer

This communication contains **privileged or confidential** information intended exclusively for the use of the Person(s) or Entity named above. If the reader of this cover page is not the intended Recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please telephone (collect) the Sender immediately. Thank you very much.

Engineering | Surveying | Aerial Photography/Mapping | Landscape Architecture | Planning
Corporate: The ROWE Building, 540 S. Saginaw Street, Ste. 200; P.O. Box 3748 • Flint, MI 48502 • O (810) 341-7500 • F (810) 341-757
With Offices In: Lapeer, MI • Mt. Pleasant, MI • Grayling, MI • Tri-Cities, MI • Myrtle Beach, SC

www.rowepsc.com

Prysby, Mike (DEQ)

From: Dean Oparka <DOparka@rowepsc.com>
Sent: Monday, March 04, 2013 1:21 PM
To: Prysby, Mike (DEQ)
Cc: Jeff Markstrom
Subject: Flint 30 & 24-inch WM

Mike,

In response to your concerns of fewer connections between the 24-inch transmission main in the Iroquois corridor we offer the following explanation. It is our understanding the purpose of this transmission main is to convey water to the southwest portion of Flint. In the Iroquois corridor alone there are 18 connections (1 about every 300 feet) feeding off the transmission main. With the aid of our water system hydraulic modeling software, we were able to reliably eliminate 4 connections. Based the modeling data, there would be little or no loss of capacity in the Iroquois corridor with the elimination of these 4 connections. There are 12-inch mains located a couple blocks east and west of Iroquois corridor, one along Chevrolet Ave to the other along Martin L. King Avenue that are able to fulfill the demands in the area even without these four connections. If you have any other questions or concerns my contact information is provided below.

Thanks,

Dean A. Oparka, P.E.

Senior Project Engineer

Rowe Professional Services Company

Mail: P.O. Box 3748

Location: 540 S. Saginaw Street

Flint, MI 48502

Office Phone: (810)-341-7500

Cell phone: (810)-701-8217

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS

(CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

ENTERED

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Natural Resources and Environment (DNRE) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint Water Service Center 3310 E. Court Street Flint, MI 48506 WSSN: 2310	Permit Stamp Area (DNRE use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 131020 MAR 18 2013 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976 MFL	
2. Owner's Contact Person (provide name for questions): Contact: Rob Bincsik Title: Supervisor of Water Distribution & Sewer Phone: (810)-766-7202		
3. Project Name (Provide phase number if project is segmented): 24-inch Water Main Replacement	4. Project Location (City, Village, Township): City of Flint	5. County (location of project): Genesee

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

cc:

DEQ
RESOURCE MANAGEMENT DIVISION

OCT 10 2012

Issued by:

Michael Proby

Reviewed by:

☐ If this box is marked see **attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DNRE District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DNRE permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions will be returned. SEE EXAMPLES BELOW. Use additional sheets if needed.

5800 feet of 30-inch water main beginning at the Flint Water Treatment Plant and commencing northwest to the intersection of Dort Highway and I-475. Continuing westerly under I-475 west to James P. Cole Boulevard. From there the main continues west across City of Flint dedicated utility right-of-way to Form General Motors Buick City property. The pipe crosses within dedicated utility right-of-way at the northern end of former GM property to the Intersection of Wager Avenue and Horton Avenue. The main changes to 24-inch pipe at this point and the route is described bellow.

23,550 Feet of 24" water main continuing west from intersection of Wager and Horton.

West, 11 blocks along Wager Avenue from Horton Ave. to N. Saginaw St.

South, 1 block, along N. Saginaw Street from Wager Ave. to E. Bishop Ave.

West, 6 blocks, along E. Bishop Avenue from N. Saginaw St. to DuPont St.

South, 7 blocks, along DuPont Street from Bishop Ave. to Pasadena Ave.

East, 1 block, along Pasadena Avenue from DuPont St. to Iroquois Ave.

South, 20 blocks, along Iroquois Avenue from Pasadena Ave. to Stockdale St.

East, Jog of Approx. 100 feet, along Stockdale Street from Iroquois Ave. to Euclid Ave.

South, 1 block, along Euclid Avenue from Stockdale St. to Welch Blvd.

West, 1 block, along Welch Boulevard from Euclid Ave. to Seminole St.

South Southwest, 3 blocks, along Seminole Street from Welch Blvd. to DuPont St.

South, 10 blocks, along Dupont Street from Seminole St. to Chevrolet Ave.

Water main changes to 16-inch at this intersection.

1068 feet of 16-inch water main continuing south along Dupont Street 3 blocks to University Avenue

Replace 5300 feet of 8-inch water main Along W. Bishop Avenue from DuPont Street to Saginaw Street

Place 1500 feet of new 8-inch water main Along DuPont Street from Pasadena to Myrtle

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address:

Jeffrey B. Markstrom, P.E.
Rowe Professional Services Company
P.O. Box 3748
Flint, MI 48502
(810)341-7500 jmarkstrom@rowepsc.com

8. Indicate who will provide project construction inspection:

- ☐ Organization listed in Box 1.
☒ Engineering firm listed in Box 7.
☐ Other - name, address, and phone number listed below.

9. Is a basis of design attached?

☐ YES ☒ NO

If no, briefly explain why a basis of design is not needed. Replacement of Existing Main

10. Are sealed and signed engineering plans attached?

☒ YES ☐ NO

If no, briefly explain why engineering plans are not needed.

11. Are sealed and signed construction specifications attached?

☒ YES ☐ NO

If specifications are not attached, they need to be on file at DNRE.

12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed?

☒ YES ☐ NO

If no, explain which deviations were made and why.

13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved?

☒ YES ☐ NO

If no, describe what coatings, additives or materials did not meet the applicable standard and why.

14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement?

(For projects not located in the public right-of-way, utility easements must be shown on the plans.)

☒ YES ☐ NO

If no, explain how access will be obtained.

15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451?

☐ YES ☒ NO

If yes, a wetland permit must be obtained.

16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules?

☐ YES ☒ NO

If yes, a flood plain permit must be obtained.

17. Is the project construction activity within 500 feet of a lake, reservoir, or stream?

☒ YES ☐ NO

If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?

☐ YES ☒ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☐ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES ☒ NO

If yes, attach a copy of a plan acceptable to the DNRE for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DNRE district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) City of Detroit

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☒ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DNRE.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, Robert Bincsik (name), acting as the Supervisor/SI holder (title/position) for
(print) (print)

City of Flint (entity owning proposed facilities) certify that this project has
(print)

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.

Robert Bincsik
Signature*

5-22-12
Date

810-577-8267
Phone

*Original signature only, no photocopies will be accepted.

CITY OF FLINT
SPECIAL PROVISION
FOR
ALTERATION OF MUNICIPAL WATER SYSTEM

ROWE: COF

1 OF 21

**Description**

This special provision replaces section 823 of the 2012 Michigan Department of Transportation Standard Specifications for Construction. This work shall consist of installing ductile iron watermain of the nominal diameter shown on the plans. This work includes the furnishing of all labor, equipment, and materials including shop drawings, required for excavation, installation, and backfilling as shown on the plans and specified herein.

A. Grades

All mains are to be laid with a minimum cover of five and 1/2 (5.5) feet unless otherwise shown on plans. This cover is to be from finish grade of the street. All mains are to be laid with a minimum cover of (6) feet under railroad track.

B. Miscellaneous Services from the City/Contractor

The Contractor shall notify the Engineer in writing, with copy of notification to City of Flint Water Service Center Supervisor, a minimum of four full working days prior to work requiring involvement of City of Flint Water Service Center personnel. The contractor shall coordinate all activity related to water main construction with the City of Flint Water Service Center personnel. Costs and time for such coordination and services shall be considered included in the progress schedule and Miscellaneous Watermain Coordination Allowance pay item.

The City will chlorinate or otherwise disinfect the water mains at the expense of the Contractor, payment to be reimbursed through the Miscellaneous Watermain Coordination Allowance pay item.

The City will furnish water for filling the mains for testing purposes. Water will be made available at connections of new mains to existing mains, or at existing fire hydrants. All connections shall be made in a manner and under conditions meeting the approval of the Water Distribution Supervisor. No charge will be made of the Contractor by the City for the use of water for testing purposes. All necessary attachments, devices and pumping for the proper use of such water are to be furnished by the Contractor at his expense, and shall be subject to the approval of the Water Distribution Supervisor.

The Contractor will furnish all tapping valves with sleeves, corporations for chlorination, pressure testing and water services. Contractor will perform all excavation, backfill, compaction, preparation and restoration of the site. The City of Flint will install all pressure taps, taps for chlorination, pressure testing and water services. Contractor shall coordinate the installation provided by the City with City personnel. Contractor shall notify City personnel one week in advance of service and update status as requested.

The City of Flint will make all connections and pressure taps to the existing water main. Contractor will perform all excavation, backfill, compaction, preparation and restoration of the site. The Contractor will supply all parts and valves as noted on the plans.

DEQ
RESOURCE MANAGEMENT DIVISION

OCT 10 2012

LANSING DISTRICT

The Contractor will remove, salvage and deliver all existing hydrants to the City of Flint (location to be determined at the preconstruction meeting).

The City will provide for watermain inspection, and any material testing, at the expense of the Contractor, payment shall be reimbursed with the Contractor Cost for Watermain Inspection pay item.

City personnel will perform installation of all service connections from corporation including curb stop and box. Installation of corporations and connections to the existing services (materials provided by Contractor) will be by City of Flint personnel. This work will include all labor by City of Flint personnel to install corporations to the existing and proposed watermain and connect existing service leads. Contractor will perform all excavation, backfill, compaction, preparation and restoration of the site.

C. Storing Materials and Supplies

Materials and supplies, if necessary, may be placed adjacent to the improvement, but ample way for foot traffic must at all times be maintained free from obstruction except with the express permission of the Water Distribution Supervisor. Any damage to the walks or property by reason of such storing of materials must be repaired by the Contractor at his own expense. The Contractor must not (*except after consent from the proper parties*) enter or occupy with men, tools, or materials any land not the property of the City, or land on which an easement or right has not been secured by the City.

D. Convenience to Public

During the progress of the work, the convenience of the public and of residents along the street must be provided for as far as practicable. Convenient access to driveways, houses and buildings along the street must be maintained wherever possible. The sidewalk or crosswalk shall be replaced, after backfilling of the water main, as noted on the plans.

All traffic control and detouring of the streets will be done according to the plans and as specified in the **Special Provision for Maintaining Traffic**.

E. Structures Above Ground

Existing structures above ground such as utility poles, street lighting standards, parking meter supports, hydrants and the like and buildings shall be protected from damage. The Contractor shall be responsible for damage to any structures or fixtures above ground caused by his operations. The Contractor shall also be responsible for damage to existing underground structures caused by his operations as previously specified herein.

F. Fire Hydrants

No material or other obstruction shall be placed within ten feet of existing fire hydrants. *Hydrants shall at all times be readily accessible to the Fire Department.*

G. Rights-of-Way

In general, work under contract that is located in City streets or on City property. Rights-of-way across private property, where required, will be secured by the City without expenses to

the Contractor. The Contractor shall hold himself strictly within the rights secured to him by the City in prosecuting the work on private property.

H. Use of Mains before Final Completion

The City shall have the right to make use of such portions of completed acceptably tested mains, during the construction period as they may find practicable. Such use by the City shall not relieve the Contractor from responsibility for any leaks or defective work in such mains and accessories which may develop prior to the final acceptance of all work under this contract.

I. Trees, Shrubs, Etc.

Trees, shrubs, etc., in the line of the water main, will be removed, as noted on the plans.

Materials

A. Concrete

Class A - (*for all structures*)

1: 2: 6: Mix (*Minimum cement per cubic yard of concrete - 1.55 lbs*)

Class B - (*Lean concrete for fill*)

1: 3: 3: Mix (*Minimum cement per cubic yard of concrete - 1.10 lbs*)

All "Class A" concrete shall show a minimum 28 day strength of 3,500 pounds per square inch, and "Class B" concrete, 1,000 pounds, per square inch.

The retempering of concrete which has partly hardened, that is, remixing with or without additional cement, aggregate or water, will not be permitted.

Transit mixed concrete may be used.

In order to obtain clean and firm bearing surfaces, all water and softened material shall be removed from excavations immediately before concrete is deposited. Concrete shall not be deposited in water nor shall water be allowed to rise over the concrete until it has hardened sufficiently to prevent injury thereto. Any flow of water into the excavation shall be diverted through proper side drains to a pump, or by lowering the ground water level by means of pumps or removed by other approved means, which will avoid washing the freshly deposited concrete.

Concrete shall be deposited in accordance with approved practice and in a manner and under conditions which will meet the approval of the Engineer.

The surface of concrete and mortar that will be exposed to the sun or to premature drying after placing shall be kept constantly moist by sprinkling at frequent intervals, or by covering with moist burlap or canvas or by other means equally effective, for a period of seven (7) days after completion. Freshly finished surfaces shall be protected by supported canvas or

other protection during rain or storms. A sufficient quantity of canvas or other protection shall be kept ready for this purpose.

B. Reinforcing Steel

Reinforcement steel shall conform to standard specifications for billet bars for concrete reinforcement, intermediate grade, serial designation A15-39 of American Society for Testing Materials.

C. Water Valve Manholes

Gatewells (gate valve in manhole) and well structures (check valve in manhole) materials shall be in accordance with Section 403 of the 2012 MDOT Standard Specifications for Construction or in accordance with the Standard Details. All valve manhole frames and covers shall be as specified on the Drawings.

An exterior seal of Wrapid Seal or a City of Flint approved alternate shall be installed to seal all valve manholes. Outside of road right-of-ways, Contractor shall use a City of Flint or Engineer approved one and one-quarter inch (1¼") pre-formed butyl rubber sealant between grade rings, valve manhole frames and valve manhole sections. Within road right-of-ways, Contractor shall use mortar between grade rings, valve manhole frames and valve manhole sections.

All tapping valves shall be installed in valve manholes. All valves, 12 inches and larger, installed in paved areas shall be installed in valve manholes to manhole frames. All structures shall be at grade when installed under paved areas or at six inches (6") below grade when installed under gravel roads.

The top of the valve manhole frames and covers shall be installed flush with finished pavement grade, finished lawn grade or six inches (6") below road grade in gravel roads.

Openings for watermain pipe inlets or outlets shall be provided in pre-cast units at the locations required and shall be true to form and approximately one inch (1") larger in diameter than the outside of the watermain pipe to provide for a mortar seal. The openings around all watermain pipe shall be completely sealed using non-shrink cement mortar grout.

Water valve manholes shall be constructed of pre-cast concrete and shall conform to ASTM C478-03 and contain a modified joint and premium rubber gasket which shall conform to ASTM C443-02. Valve manhole sections shall be installed on eight inch (8") thick pre-cast base slabs or installed integrally with the slab section. The valve manhole size shall be determined in accordance with the table provided on the watermain detail sheet.

D. Manhole Steps

All manhole steps shall be copolymer polypropylene plastic and installed in valve manholes at a spacing of sixteen inches (16") on center. All Copolymer polypropylene steps shall be M.A. Industries PS-1-PF, American Step Co. ML-10 with one-half inch (½") grade 60 steel reinforcement or a City of Flint approved alternate.

E. Pipe

Pipe used in the water distribution system shall be ductile iron pipe centrifugally cast in metal or sand-lined molds conforming to ANSI/AWWA C150/A21.50 and ANSI/AWWA C151/A21.51 as amended to date. Push-on joints, mechanical joints, and/or restrained joints shall conform to ANSI/AWWA C104/A21.4 as amended to date.

<u>DIAMETER</u>	<u>DESIGNATION</u>	<u>THICKNESS</u>
4-inch	Class 54	.35-inch
6-inch	Class 54	.37-inch
8-inch	Class 54	.39-inch
10-inch	Class 54	.41-inch
12-inch	Class 54	.43-inch
16-inch	Class 54	.46-inch
18-inch	Class 54	.47-inch
20-inch	Class 54	.48-inch
24-inch	Class 54	.50-inch

The metal thickness class, net weight of the pipe without lining, the nominal size, and the manufacturers identifying symbol shall be clearly marked on each length of pipe.

Types of pipe and pipe sizes larger than 12-inch shall be specified individually based upon the particular conditions of the specific project. The pipe shall have cement-mortar lining conforming to ANSI/AWWA C104/A21.4 as amended to date. The pipe shall have a push on joint with a single rubber gasket and shall include brass or bronze wedges to permit electrical thawing. Polywrap meeting ANSI/AWWA C105/A21.5-99 for 8 mil Linear Low Density polyethylene encasement is required to cover all underground watermain and appurtenances including service taps and excluding copper service lead tubing.

I. AWWA Body

RESILIENT - SEATED GATE VALVES

A. Scope

This specification covers iron-body resilient-seated gate valves with non-rising stems (NRS) from 3" to 12" nominal pipe size.

B. Specific Requirements

i. Standard

The valves covered by this specification shall be in conformance with requirements of the current AWWA Specification C515, Underwriters Laboratories Standards UL262 and Factory Mutual Standard 1130. The Ductile Iron Body, Bonnet, Seal Plate, and Wedge are manufactured from Iron conforming to ASTM A536. The epoxy coating shall be in accordance with ANSI/AWWA C550 and certified to NSF61. The wedge is fully rubber encapsulated to meet ASTM D429 requirements. The following specifications also apply.

ii. General

Gate valves are to be FlowMaster® Resilient Wedge Gate Vales as manufactured by East Jordan Iron Works.

All valves shall be mechanical joint type with non-rising stems and O ring seal. Valves are to be placed in the vertical position and open to the right (*clockwise*). The valve interior shall be coated with an epoxy.

The manufacturer shall supply catalog data including illustrations and part schedules.

The manufacturer shall furnish the purchaser with an affidavit stating the valve and all materials used in its construction conform to the applicable requirements of this standard and the supplementary specifications and that all tests specified therein have been performed and met.

BUTTERFLY VALVES

A. Scope

This specification covers butterfly valves of the approved type.

B. Specific Requirements

i. Standard

All butterfly valves shall conform to the requirements of AWWA C504 in all respects, except as may be specifically modified herein.

ii. General

Butterfly valves are to be Dresser, Series 450 or Groundhog Series as manufactured by Henry Pratt Company.

Valve ends shall be suitable for flange connections. Valve body shall be high-strength cast iron ASTM A126 Class B with 18-8 Type 304 stainless steel body seat. Valve vane shall be high-strength cast iron ASTM A48 Class 40, having rubber seat mechanically secured with an integral 18-8 stainless steel clamp ring and 18-8 stainless steel self-locked screws.

Rubber seat shall be a full-circle 360 degree seat not penetrated by the valve shaft. Valve shaft shall be one piece, extending full size through the entire valve and operator with no neck-down, keyways, or holes to weaken it. Valve shaft shall have 304 stainless steel journals rotating in reinforced teflon bearings. Valve shall have permanently set two-way thrust bearing. Packing shall be "triple-seal" rubber designed for permanent duty in underground service.

Valve operator shall be of the traveling-nut type, sealed, gasketed and lubricated for underground service. It shall be capable of withstanding an overload input torque of 450 ft. lbs. at full-open or full-closed position without damage to the valve or valve operator. It shall be designed to resist submergence in water of 25 ft. head pressure.

Valve shall be capable of easy closure by one person using standard valve key, even under emergency line-break conditions as severe as those that may require a valve maximum opening torque requirement of as much as two times AWWA Class 150B.

All valves shall open to the right (*clockwise*) and be equipped with a 2" square AWWA operating nut.

The manufacturer shall supply catalog data including illustrations and part schedules.

The manufacturer shall furnish the purchaser with an affidavit stating the valve and all materials used in its construction conform to the applicable requirements of this standard and the supplementary specifications and that all tests specified therein have been performed and met.

CHECK VALVES

A. Scope

This specification covers check valves of the approved type.

B. Specific Requirements

i. Standard

The valves covered by this specification shall be in conformance with requirements of the current AWWA Specification and ANSI B16.1 Class 125 rated to a minimum of 250 psi.

ii. General

Check valves shall: be manufactured from gray cast iron meeting or exceeding ASTM A126 Grade B; comply with AWWA C508; allow for clear waterway opening; possess a ductile iron clapper arm conforming to ASTM A536 Grade 65-45-12; possess a disc which does not contact the body when the valve is in full-open position; possess a shaft which is stainless steel with corrosion resistant bearings.

Check valve brand shall be American Flow Control 50-SC swing check valve or approved equal.

TAPPING VALVES AND SLEEVES

A. Scope

This specification covers tapping valves and sleeves of the approved type.

B. Specific Requirements

i. Standard

The valves, hardware and sleeves covered by this specification shall be in conformance with requirements of the current AWWA Specification rated to a minimum of 250 psi.

ii. General

Tapping valves, hardware, sleeves and flanges shall be an approved type, as proposed by Shop Drawing submittal, as manufactured by East Jordan Iron Work for FlowMaster®. Sleeves, flanges, and hardware shall be stainless steel.

LEVEL CONTROL VALVES

A. Scope

This specification covers level control valves of the approved type.

B. Specific Requirements

i. Standard

The valves, hardware and sleeves covered by this specification shall be in conformance with requirements of the current AWWA Specification rated to a minimum of 250 psi.

ii. General

Level control valves are to be Singer Valve model 106-A-Type 3 / 206-A-Type 3, as manufactured by Singer Valve Company.

Valve ends shall be suitable for flange connections. Both the Model 301-4 Pilot spring range (elevation) and Model 625-RPD differential (delayed opening) set-point preset's are to be set by Singer Valve. The City Engineer will be provided ranges prior to contractor purchasing/ordering the valve.

IN LINE STOPS

A. Scope

This specification covers in line stops of the approved type.

B. Specific Requirements

i. Standard

The valves covered by this specification shall be in conformance with approved standards as determined by the City of Flint and the Engineer.

ii. General

In line stops are to be the approved type and manufacturer, as proposed by Shop Drawing submittal.

J. Hydrants

1. Scope

This specification covers post-type dry-barrel hydrants.

2. Specific Requirements

A. Standard

The hydrants covered by this specification shall be in conformance with requirements of the current ANSI/AWWA Standard C502 with revisions to date. Hydrants also shall be Underwriters Laboratories Standard UL246 listed and Factory Mutual 1510 approved. The Ductile Iron castings shall be manufactured from iron conforming to ASTM A536, and the following supplemental specifications.

B. General

Hydrants are to be East Jordan Iron Works Model 5BR250, part #55512D.

Hydrants are to be of the "*Breakable*" or "*Traffic Type*" with replaceable components of barrel and stem. The hydrants shall be compression type shut-off which will remain closed in event of accidental damage or breaking of the barrel. The seat valve shall be bronze to bronze material.

Hydrants are to have 5-1/4" inch main valve and 6-inch side inlet. Inlet to have mechanical joint unless otherwise specified on bid sheet. The hydrants shall be provided with a drain or waste outlet which is part of the main valve mechanism; at delivery the drain or waste outlet is to be tapped and plugged.

Hydrants are to have "O" ring packing. The hydrant shall be painted chrome yellow. The top of hydrants shall be painted according to the standard detail

sheet in the plans. Hydrants will open to right (clockwise) and the direction of opening shall be clearly shown by an arrow and word "open" cast in relief, so as to be clearly visible on the top of the hydrant. Hydrants shall have two 2 1/2 inch hose nozzles and one 4 1/2 inch pumper nozzle with NST threads and caps with chains. Operating and cap nuts are to be square. The square is to measure 7/8 inches across the flats at the base and not less than 3/4 inches at the top. Height of the nut is not to be less than one inch.

Mechanical joint hydrants are to include joining material. Hydrants shall be designed so that extensions to the barrel may be added above ground without excavation. Hydrant design shall be such that no excavation is necessary to remove the main stem and the movable parts of the drain valve.

Trench Details are as noted on the plan sheets. The standard depth of bury (DOB) for a hydrant is 6'0" unless otherwise noted on plans. The contractor will salvage and deliver to the City all existing hydrants. The hydrants shall be painted as noted in the plans (detail sheet).

K. Fittings

1. Scope

This specification covers ductile iron fittings 3 - 48 in. for water.

2. Specific Requirements

a.. Standard

The fittings covered by this specification shall be in conformance with requirements of the current AWWA Standard C 153/A21.53 and C 111/A 21.11 and the following supplemental specifications.

b. General

All fittings are to be mechanical joint, cement lined, with a 350 psi pressure rating. When requested, fittings should be supplied to fit over both centrifugally cast and sand cast pipe.

Mechanical joint fittings are to include joining material.

L. Gatewell Rings and Cover

Gatewell castings shall be East Jordan Iron Works No. 104018L01 with cover type "CF-6", or approved equal. Cover shall contain type "A" legend with the text "WATER" cast on it.

M. Valve Boxes

Valve boxes are to be the EJIW 95E, Bibby 95E, or Tyler 6500 Screw Type, 2-piece, arch pattern for services. Boxes for mains shall be EJIW 8560 series 3-piece with #6 base as specified. Gray Iron will conform to ASTM A48 Class 35B gray iron with cold tar asphaltic dip. Lids shall have the word "water" cast into the lid.

N. Encasement Pipe

Steel pipe where specified for encasement pipe shall be new welded steel pipe and shall meet standards of ASTM 139, Grade B. The pipe shall be 1/4 (.250) inch to 13/32 (.406) inch wall thickness as specified on the plans and special provision if included in bid package.

O. Separator Skids

Skid runners that completely separate casing and carrier pipes shall be utilized. Methods and materials shall be approved by the Engineer.

Where hardwood runners are approved for banding to water carrier pipe, they shall be treated with pentachlorophenol-petroleum solution. The pentachlorophenol-petroleum solution shall consist of not less than 42 percent, nor more than 52 percent of pentachlorophenol dissolved in a heavy petroleum solvent. Then pentachlorophenol and the heavy petroleum solvents shall conform to the requirements of the current specifications for Timber preservatives, AASHTO Designation: M133.

Pentachlorophenol-petroleum solution may be purchased as a ready-to-use product, or a concentrate to be diluted with the petroleum solvent.

The wood may be pressure treated or may be immersed in the specified pentachlorophenol-petroleum for a period of at least seven days.

P. Anchoring Fitting

When anchoring fittings are specified, they shall conform to the following:

American Double-X or approved equal ductile retainer gland with cap screws.

Clow F-1218 or approved equal special mechanical joint anchoring elbow.

Clow F-1215 or approved equal anchoring coupling.

Clow F-943 or approved equal special hydrant tee.

Megalug series 1100 shall be used for mechanically restrained joints.

Q. Corporations and Curb Stops and Saddles shall be approved Ford type or similar approved.

Detailed Specifications

A. Scope

Under this item, the Contractor will furnish all labor, pipe, valves, fittings, valve boxes, hydrants, manholes including rings and covers, service leads and any other material necessary for a complete main laying job. All materials and workmanship shall be as approved by the Engineer and City of Flint Water Service Center Distribution Supervisor.

B. Excavation

The locations of existing utilities are shown in accordance with available data. The Contractor shall expose those utilities where required, to determine actual locations. The Contractor shall not disturb nor cut into any existing water mains in service without City of Flint Water Distribution Supervisor's approval.

The Contractor shall explore the street far enough in advance of laying pipe to check exact locations of underground structures, sewers, water mains, services, also gas and electric structures. The Contractor shall contact the Engineer if any adjustments to plan and profile of new water mains are needed to avoid interference with existing structures, and the Contractor shall be responsible for all unnecessary injury to underground structures in the course of his operations.

Trenches for mains shall be excavated so that there will be a minimum net clearance of twelve inches on each side of the barrel of the pipe. Water main trenches shall be excavated to the lines, grade, and cross-section shown on the plans or to such modifications as may be approved Water Distribution Supervisor, or Engineer to meet or pass existing utility structures. Foreign materials encountered in the trench, such as slabs of wood, boulders, and the like, which obstruct the trench shall be removed with other excavation and where such obstructions occur, at or near the bottom of the trench, requiring excavation below the standard grade. Unnecessary excavation below grade by the Contractor shall be refilled to grade with tamped sand. Excess excavated materials not required in backfilling shall be removed and disposed of by the Contractor. The trench shall be brought back to grade by 1) backfilling to bottom of proposed aggregate base with approved sand meeting the requirements for MDOT Class II granular Material, compacted to 95% of its maximum unit weight at optimum moisture content, and 2) placement of aggregate base as called for on the plans or, as a minimum, place 8 inches minimum depth of 100% crushed limestone meeting the requirements for MDOT dense graded aggregate 21AA, compacted to 98% of its maximum unit weight at optimum moisture content,

Where condition of the ground requires, the sides of trenches shall be securely held by bracing sheeting which may be removed in units when the level of the backfill has reached dept where it is safe to pull the sheeting. No sheeting, bracing or other timber shall be left in the trench upon completion of the main or other structure.

The contractor is required to control the infiltration of groundwater into the excavation. If ordinary methods of drainage such as bailing, pumping, etc., prove unsatisfactory, the contractor is responsible for dewatering.

The bottom of the trench shall be shaped so as to conform as nearly as possible to the outside of the pipe, particular care being taken to recess the bottom of the trench in such manner to relieve the bell of all load.

Where trench must be cut through pavement, driveway, or walk, particular care shall be taken to unnecessarily damage adjoining areas of pavement, driveway or walk. Cuts are to be made with a smooth edge by use of a concrete saw.

Other underground mains, sewers or structures encountered in the excavation shall be adequately supported during the Contractor's operations, and before backfilling of the trench, shall receive a permanent support of lean concrete (*Class B*), extending from the

bottom of the trench to the underside of the main or other structure. In lieu of such concrete pedestal support, other approved support may be used satisfactory to the Water Distribution Supervisor.

Small pipes and services encountered in the excavation shall, where deemed necessary by the Water Distribution Supervisor, be properly supported and protected from possible damage by lean concrete (*Class B*) or timber beams of adequate strength extending across the trench into undisturbed ground or by concrete pedestals extending to the bottom of the trench, or by other approved method.

C. Laying Pipe and Fittings

In handling or laying pipe, no metal shall be allowed to come in contact with the inside of the pipe. Care shall be taken not to damage the pipe or pipe coating and no damaged or imperfect pipe may be used in the work. Minor damage to pipe coating may be repaired subject to the approval of the Water Distribution Supervisor.

Pipe shall be carefully laid in the dry and to line and grade and care shall be taken to keep the interior of the pipe clean and free from dirt and other foreign materials. Rubber gasket plugs or approved bulkhead shall be used for this purpose. Mechanical joint pipe fittings shall be jointed with the bolts, gaskets and follower rings furnished by the pipe manufacturer, and the procedure in making such joints shall be in accordance with manufacturer's instructions and recommendations.

All in line bends, fitting, tees, solid sleeves, reducers, and hydrants shall be encased in 8 mil polyethylene. The polyethylene film tube shall be installed in accordance with ANSI/AWWA C 105/A21.5, Method A. Method A consists of cutting the polyethylene tube 2 feet longer than the pipe to provide an overlap at the joints.

Single-rubber-gasket joint pipe shall be installed according to the manufacturer's instructions and recommendations and is to have the required number of brass wedges installed at all joints for electrical thawing.

At crossings, one (1) full length of water pipe shall be located so both joints will be as far from the sewer crossing as possible, see crossing detail #SD-17W.

D. Backfilling

The Contractor shall backfill the trench according to MDOT Standard Plan R-83(Series), Trench Detail G. This Detail utilizes MDOT class II or IIA granular material, thoroughly tamped in not to exceed twelve (12) inch layers and compacted to 95% of its maximum density. Material excavated from trench shall not be left on the roadway, but shall be trucked away or deposited on the adjoining property if approved by owners of said property. The roadway shall be kept clear at all times of excavated material. Caved material shall be dug out of the trench in the same manner and the entire excavation backfilled with sand as specified above.

Where gravel surfacing in graveled streets, roads or driveways is excavated, in work under this contract, such gravel surfacing shall be replaced over the disturbed area to the original depth and grade and of material similar and equal to the original material.

Where hot mixed asphalt (HMA) is being placed, a minimum of 12 inches of crushed limestone aggregate base, meeting the requirements of MDOT dense graded aggregate 21AA, shall be placed and compacted to 98% of its maximum unit weight at optimum moisture content, in preparation for the HMA pavement per plans.

Where concrete curbs or sidewalks or private driveways are disturbed, damaged, or cut through by the Contractor for work under this contract, such curbs and sidewalks or driveways shall be removed and replaced.

Except where plans call for payment of aggregate base by other means, payment for water mains will be made on the basis of excavation and backfill as herein specified and no claims for extras on these items will be allowed.

E. Testing Water Main

After the line is installed, it shall be pressure tested by the Contractor (witnessed by City of Flint Water Distribution personnel) for two (2) hours at 150 psi. Allowable leakage will be calculated by using the formula-

Allowable leakage is:

$0.092 \text{ GPH} \times \text{LENGTH OF PIPE (IN FEET)} \times \text{NOMINAL DIAMETER (INCHES)} / 1000 \text{ FT}$
@ 150 PSI TEST PRESSURE

Chlorination shall be completed in accordance to AWWA C650, pressure testing shall be accordance with AWWA C600-05 and disinfection shall be per AWWA C651-99. Chlorination and disinfection of new mains laid under this contract will be performed by the City soon after testing and if feasible, in connection with flushing of the main. The chlorinated water shall be drained out of the pipe line by the Contractor and he shall be responsible for repair of any erosion or damage resulting from this operation. If, during the filling, testing or disinfection of any section of main, turbidity appears in the samples or if it becomes impossible to obtain a sterile sample by chlorination, the Contractor shall remove, at his own expense, the source of the turbidity or contamination, by flushing and/or draining, entering, digging up, and cleaning, to the end that it may be possible to obtain a clear sterile water from the main.

Bacteriological testing shall include two (2) consecutive safe bacteriological samples, obtained at least 24 hours apart for each run of pipe, not to exceed 1,200 feet.

F. Valves

1. Installation

Gate valves up to and including 12" shall be placed in a vertical position and all sizes above 12" shall be placed horizontally in the line. Care shall be taken that the spindle of a vertical valve is vertical and that horizontal valves have the shaft of the driving pinion in a vertical position.

All Valves which are located in the pavement shall have valve manholes (*Gatewells*). 6" and 8" gate valves not in the pavement shall have valve boxes with covers flush with the ground except where Gatewell is specified.

Check valves in well structures shall be installed per manufacturers specifications, per plan details and as directed by the Engineer.

Tapping valves and sleeves shall be installed by approved installers per manufacturers specifications and as directed by the Engineer.

In line stops shall be installed by approved installers per manufacturers specifications and as directed by the Engineer. The work of In Line Stop of the valve size specified shall consist of installation and removal of in-line valve apparatus, capable of stopping flow in a water main under pressure, of the size specified commensurate to the diameter of the water main to which flow is to be stopped, at locations directed by the Engineer, and includes all work for excavation, concrete pad construction, In Line Stop installation and removal, and backfilling with select fill CIP, meeting the requirements of Granular Material Class II compacted to not less than 95% of its maximum unit weight in 12 inch maximum lifts. This work shall include excavation of an 8' x 8' minimum hole as preparation for the In Line Stop. Traffic control and pavement removal and replacement is not included and shall be paid for separately. Providing materials, labor, and equipment for concrete for each In Line Stop, a minimum of 2' in depth and 6' by 6' in horizontal dimension, is included in this work. The concrete shall have a minimum strength of 2000 psi prior to placement of any In Line Stop apparatus.

Contractor is to provide the control valve, and all necessary materials and equipment to aid the City of Flint personnel with the removal and replacement of the valve.

2. Valve Manholes (*Gatewells*)

Gatewells (gate valve in manhole) and well structures (check valve in manhole) shall be built in accordance with the details and at the locations shown on the plans and in accordance with the applicable portions of Section 403 of the MDOT Standard Specification, and as specified in this Special Provision.

Manhole bottoms shall be of "Class A" concrete floated smooth. Sidewalls shall be of brick or manhole blocks. Brick or block shall be laid with the long dimension radially in the manhole. Every brick or block shall have full mortar joints on the bottom and sides, which shall be formed at one operation by placing sufficient mortar on the bed and forcing the brick or block into it. Horizontal joints shall not exceed 3/4" except for exterior joints in the domed portion of the manhole and the vertical joints on the inside of the manhole are built up. Brick or block manholes shall be plastered on the outside with a 2" coat of mortar. Mortar used for masonry work shall only be mixed in quantities which are immediately useable. Any mortar which is set sufficiently to require retempering shall not be used. When the manhole is completed, cast iron ring and cover are to be set in place to line and grade.

If the Contractor is approved to use precast manholes, the *Gatewell* shall be in accordance with Section 403 of the MDOT Standard Specifications, and as shown on the plans. Where contractor is approved to use precast manhole components, it shall be the contractor's responsibility to order manhole components with proper pipe hole location and orientation and contractor accepts all costs for re-ordering new components and disposition of unacceptable components.

G. Fire Hydrants**1. Scope**

Under this item, the Contractor shall install fire hydrants as shown on the plans and specified herein.

2. Installation

Fire hydrants shall be installed with the barrel vertical and with base of hydrant head substantially at final grade. At the base of the barrel, of each hydrant, shall be placed not less than one cubic yard of coarse gravel to provide drainage and thrust blocks will be required if mechanical joint pipe and hydrant is used. Backfill shall be thoroughly tamped around hydrant barrel for its entire depth below ground.

H. Concrete Thrust Block, Encasement & Anchoring Fittings**1. Scope**

Under this item the Contractor shall furnish all labor, materials, tools and equipment for all concrete thrust blocks at angles in the main or as otherwise shown on the plans, all concrete encasement of water main required and for all retainer glands or anchoring fittings specified plans. Retainer glands are not to be used on cast iron pipe.

2. Materials

Concrete materials, reinforcing steel and concrete shall conform to the plans and as specified herein. All concrete used under this item shall be "Class A" concrete.

3. Thrust Blocks

At all tees, bends and ends of main, or as otherwise shown on the plans, a "Class A" concrete thrust block shall be placed between the side or end of the pipe or fitting and DDE extending to the undisturbed side or end of the trench as the case may be to take up thrust in the line. Thrust blocks shall be City standard as shown on plan sheets or approved equal.

When special conditions are encountered in which concrete thrust blocks do not give adequate protection to the installation, in the opinion of the Water Distribution Supervisor, steel tie rods shall be installed. No claims for extras will be allowed when tie rods are specified. Concrete thrust blocks will be installed in all cases in addition to the tie rods where specified.

4. Anchoring Fittings

Where specified on the plans, anchoring fittings shall be used in lieu of concrete thrust blocks.

I. Maintenance of Trenches

1. Scope

It is the intention of these specifications that street right-of-way surfaces shall be replaced and left in the same (or better) condition as before excavation was made. Where excavation has been made in an established lawn area, the contractor will be required to grade, reseed with a perennial grass seed, and cover with straw, after a reasonable time has been allowed for settlement and maintenance of the trench. All proposed upgrades to the roadway are outlined on the plans.

J. Service Lines

1. Scope

Service leads to existing and buildings shall be Type K Copper. The sand backfill (when under the influence of the roadway) will be compacted to 95% of the Maximum density. The contractor is to provide all Type K Copper, curb stop, and box. Contractor is to provide all corporations (installed by City of Flint). City of Flint personnel will make all connections to existing service lines. Exact locations of services shall be located in the field as supervised by the Water Distribution Supervisor. Service lines shall be perpendicular to buildings and main having no curves between building and main.

Trenchless installation of water services using push bores, directional drilled, and other approved methods shall use standard, approved construction methods. The Contractor shall submit a boring plan detailing equipment, materials and procedure to be used prior to beginning work. The Contractor shall be responsible for locating any existing utilities in the bore route for the new service lead ensuring no damage to existing utilities. Contractor will be responsible for approved repair to any damaged utility facilities at no additional cost to the contract.

K. Filling Abandoned Structures and Main with Flowable Fill

1. Scope

The abandoned structures, vaults, and water main shall be *completely* filled with flowable fill (lean cementitious grout) unless specified for removal and as directed by the Engineer. This shall take place once the old water main is completely out of service. The Contractor shall utilize enough points to inject the flowable fill into the abandoned water main to *completely* fill it for the entire length of the project, or as directed by the Engineer. Furnishing, installing and, if necessary, removal of all fittings, standpipes, caps and work necessary to completely fill abandoned structures and main are included in payment for Flowable Fill.

Measurement And Payment

The work of constructing water main will be paid for at the contract unit price for the actual quantity of each of the following pay items actually constructed.

<u>Pay Item</u>	<u>Pay Unit</u>
Aban Gatewell	Each
Rem Hyd Asmbly	Each
Rem Gatewell	Each
Rem WM	Foot
Hydrant, Adj	Each
Curb Box, Adj	Each
Gate Box, Adj, Special	Each
Rem Valve Box	Each
WM, DI, ____ inch, TD F	Foot
WM, DI, ____ inch, TD G	Foot
WM Bend, 24 inch, Field Fit	Each
In Line Stop	Each
Hyd Asmbly	Each
GV and Well, ____ inch	Each
BFV and Well, ____ inch	Each
GV and Box, ____ inch	Each
Level Control Valve, ____ inch	Each
WS, ____ inch, Open Cut	Foot
WS, ____ inch, Bored	Foot
Flowable Fill	Cyd
Pressure Testing	Lump Sum
Contractor Cost for Watermain Inspection	Dlr
Miscellaneous Watermain Coordination Allowance	Lump Sum

Connections and pressure taps to the existing watermain, installation of corporations and connections to the existing services (materials for both provided by Contractor) will be by City of Flint personnel. This work will include all labor by City of Flint personnel to make connections and install corporations to the existing and proposed watermain. All material and equipment necessary to excavate and restore the area will be the responsibility of the Contractor and included in the **Miscellaneous Watermain Coordination Allowance** pay item.

Dewatering operations (trench and/or pipe) associated with **Alterations to the Municipal Water System** will not be paid for separately, but will be included in the contract unit prices bid for the effected pay items.

The cost of excavation, disposal of excess material, and furnishing, placing, and compacting the backfill, will be considered as included in the contract unit prices bid for the effected pay items.

WM, DI, ____ inch, TD F and WM, DI, ____ inch, TD G of the sizes specified, will be measured in place per *foot* along the centerline of the pipe, with no deductions for fittings. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the work specified herein and as shown on the plans, including inspection/water main connection fees paid to the City of Flint Water Service Center, furnishing and installing all appurtenances, tees, temporary

and permanent plugs, oversize solid mechanical joint sleeves, fittings, reducers, gaskets, polyethylene encasement, knocking down existing water boxes, thrust blocks, bracing or sheeting, and all other miscellaneous items necessary for the installation of pipe and reconnection to the Municipal Water System as described in the plans. Payment for all material, labor and equipment necessary to remedy an unsatisfactory hydrostatic test, including removing and replacing any backfill, shall be considered as included in the contract unit price for **WM, DI, ____ inch, TD F and WM, DI, ____ inch, TD G.**

WM Bend, ____ inch, Field Fit of the diameter specified, of any nominal angle, will be measured in place per *each* ductile iron angle fitting utilized to re-route watermain due to unforeseen field fit conditions. This item shall not be used for routing watermain by design as shown on the plans.

WM, DI, ____ inch, Connect To Ex of the size specified, will be measured in place per *each* with no deduction for fittings and sleeves or work and materials to cup and cap existing mains with approved methods and materials. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the work specified herein and as shown on the plans, except connections to the existing watermain (materials provided by Contractor) will be provided by City of Flint personnel. This work will include all fees and labor by City of Flint personnel to make a connection to the existing watermain. All material and equipment necessary to excavate and restore the area will be the responsibility of the Contractor and included in other pay items.

WS, ____ inch, Open Cut of the sizes specified will be measured in place per *foot* along the center of the trenched in Type K copper tubing. **WS, ____ inch, DI, Open Cut** of the sizes specified will be measured in place per *foot* along the center of the trenched in ductile iron service lead. **WS, ____ inch, Bored** of the sizes specified will be measured in place per *foot* along the center of the bored length of water service lead of any material type. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the work specified herein and as shown on the plans. The sand backfill (when under the influence of the roadway) will be compacted to 95% of the Maximum density. When in pavement areas, 21AA crushed limestone subbase, 8 inch minimum depth, will be compacted to 98% of the Maximum density. The cost for excavating for the curb box, placing curb box & curb stop, furnishing corporations and coordination/connection fees with City of Flint forces on placing corporations and connection to existing leads will be included in the pay item for **Curb Stop, Box and Corp.** Locations of services shall be supervised in the field by the Water Distribution Supervisor. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the work.

GV and Box, ____ inch of the type and size specified, will be paid for at the contract unit price *Each*, which price shall be payment in full for furnishing and installing the valve box complete and ready for use. Contractor shall remove, salvage and stockpile at an approved on-site location all existing valve boxes paid for as **Rem Valve Box** which will be paid for at the contract unit price per *Each* existing 3-piece (or similar) valve box unit salvaged and stockpiled including all labor and equipment to complete the work.

GV and Well, ____ inch of the valve size specified with associated gateway diameter per plan details, will include furnishing and installing the gate valve and gateway as specified. The Contractor will be required to provide oversize valves as specified in the plans, and will not be paid *extra* for this. The gateway cover castings shall be measured and paid for separately. The valve and gateway will be considered one unit, and paid as *Each*.

BFV and Well, ____ inch of the valve size specified with associated gateway diameter per plan details, will include furnishing and installing the butterfly valve and gateway as specified. The

Contractor will be required to provide oversize valves as specified in the plans, and will not be paid *extra* for this. The gatewell cover castings shall be measured and paid for separately. The valve and gatewell will be considered one unit, and paid as *Each*.

CV and Well, ___ inch of the valve size specified with associated well structure diameter per plan details, will include furnishing and installing the check valve and well as specified. The Contractor will be required to provide oversize valves as specified in the plans, and will not be paid *extra* for this. The well structure cover castings shall be measured and paid for separately. The valve and well will be considered one unit, and paid as *Each*.

TV and Well, ___ **X** ___ inch of the tapping tee, valve, and sleeve size specified with associated gatewell diameter per plan details, will include furnishing and installing the tapping tee, valve, sleeve, and gatewell as specified, except that the City of Flint personnel will supervise or perform the tap. The gatewell cover castings shall be measured and paid for separately. The tapping tee, valve, sleeve and gatewell will be considered one unit, and paid as *Each*.

Hyd Asmbly will be paid for at the contract unit price, *Each*, which price shall be payment in full for furnishing and installing the hydrant and valve assembly, including connection to and pipe from the main regardless of length, complete and ready for use at the locations shown on the plans. Contractor shall remove, salvage and deliver to the City all existing hydrants paid for as **Rem Hyd Asmbly**.

Pressure Testing will be paid for as a *Lump Sum*. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the pressure test procedure and set up the water main for chlorination (equipment by Contractor). City of Flint Water personnel will perform the Chlorination of the water main. Additional time and labor required (call back time) for re-chlorination or additional testing oversight due to non-passing tests will be billed to the Contractor, at a rate of \$250 per hour.

Any required auxiliary valves (In Line Stop), or any other item for which separate items have been set up will be paid for separately.

Contractor Cost for Watermain Inspection will be paid for as by the *Dollar*. The price shall include payment in full for City of Flint personnel to inspect watermain installation. Labor required for watermain inspection be billed to the Contractor, at a rate of \$210 per hour. Additional inspection time required due to contractor laxity will be billed to the Contractor at the rate stated above and will not be compensated as a part of this project.

Aban Gatewell will be paid for at the contract unit price per *Each* gatewell of any size abandoned in place by removing the structure to a minimum of two feet below proposed bottom of pavement subbase or finished grade when outside pavement and filling the structure with sand meeting the requirements of MDOT Class II Granular Material tamped and compacted to the Engineer's satisfaction. Payment shall include all labor, equipment and materials to complete this item of work.

Rem WM will be paid for at the contract unit price per *Foot* of watermain of any size or material type removed and disposed of off site. Removed material shall become the property of the Contractor to be properly disposed of. Payment includes all labor, equipment and disposal costs to complete this item of work.

Rem Gatewell will be paid for at the contract unit price per *Each* gatewell of any size or material type removed and disposed of off site. Removed material shall become the property of the

Contractor to be properly disposed of. Payment includes all labor, equipment and disposal costs to complete this item of work.

Cutting and capping the existing water main as necessary will be included in the water main pay items listed above and will not be paid for separately. This work will included cutting and capping water main of any size or material by approved methods and shall include saw cutting, fitting connection and cap fitting or plug of approved type.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS
 (CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

ENTERED

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Natural Resources and Environment (DNRE) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint Water Treatment Plant 4500 North Dort Highway Flint, MI 48507 WSSN: 2310	Permit Stamp Area (DNRE use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 121073 NOV 02 2012 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976 MFP	
2. Owner's Contact Person (provide name for questions): Contact: Brent Wright Title: Water Treatment Plant Supervisor Phone: (810) 787-6537		
3. Project Name (Provide phase number if project is segmented): Torrey Road Booster Station Contract No. 2	4. Project Location (City, Village, Township): City of Flint	5. County (location of project): Genesee

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

cc:

 DEQ
 RESOURCE MANAGEMENT DIVISION

OCT 19 2012

LANSING DISTRICT

Issued by:

Michael P. Prybyl

Reviewed by: _____

☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DNRE District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DNRE permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions will be returned. SEE EXAMPLES BELOW. Use additional sheets if needed.

Project includes replacing the existing pumps, motors and starters at the Torrey Road Booster Station, near Tweltch Ave. and Hammerburg Road. The proposed pumps will be horizontal split case pumps and are sized in accordance with the anticipated future demand points as shown below. Additional improvements include removal and replacement of the existing valves, piping and electrical equipment required for proper operation. Electrical replacement provisions include a generator connection. Permanent standby power is not included at this time.

Pump #1 2000 gpm @ 66' TDH

Pump #2 2500 gpm @ 76' TDH

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address:

Jeff Markstrom, P.E.
 ROWE Professional Services Company
 540 S. Saginaw, Suite 200, P.O. Box 3748
 Flint, MI 48502
 Phone (810) 341-7500, email: jmarkstrom@rowepsc.com

8. Indicate who will provide project construction inspection:

- ☒ Organization listed in Box 1.
☐ Engineering firm listed in Box 7.
☐ Other - name, address, and phone number listed below.

9. Is a basis of design attached?

☒ YES ☐ NO

If no, briefly explain why a basis of design is not needed.

10. Are sealed and signed engineering plans attached?

☒ YES ☐ NO

If no, briefly explain why engineering plans are not needed.

11. Are sealed and signed construction specifications attached?

☒ YES ☐ NO

If specifications are not attached, they need to be on file at DNRE.

12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed?

☒ YES ☐ NO

If no, explain which deviations were made and why.

13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved?

☒ YES ☐ NO

If no, describe what coatings, additives or materials did not meet the applicable standard and why.

14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement?

(For projects not located in the public right-of-way, utility easements must be shown on the plans.)

☒ YES ☐ NO

If no, explain how access will be obtained.

15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451?

☐ YES ☒ NO

If yes, a wetland permit must be obtained.

16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules?

☐ YES ☒ NO

If yes, a flood plain permit must be obtained.

17. Is the project construction activity within 500 feet of a lake, reservoir, or stream?

☐ YES ☒ NO

If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?

☐ YES ☒ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☐ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES ☒ NO

If yes, attach a copy of a plan acceptable to the DNRE for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DNRE district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) City of Detroit

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☒ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DNRE.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, BRENT F. WRIGHT (name), acting as the PLANT SUPERVISOR (title/position) for

(print)

(print)

CITY OF FLINT

(print)

(entity owning proposed facilities) certify that this project has

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.



Signature*

5-24-12

Date

810-787-6537

Phone

*Original signature only, no photocopies will be accepted.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

Permit Application for Water Systems (Continued)

PROJECT BASIS OF DESIGN – FOR WATER MAIN PROJECTS

PROJECT NAME: Torrey Road Booster Station - Contract No. 2

For this PROJECT the following information must be provided per Act 399 unless waived by the Department. For projects other than water main installation, or if additional space is needed, attach separate sheet(s) with detailed Basis of Design calculations.

- A. A general map of the initial and ultimate service areas
☒ Included on engineering plans ☐ Attached separately
- B. Number of service connections served by this permit application Unchanged
- C. Total number of service connections ultimately served by entire project Unchanged
- D. Residential Equivalent Units (REUs) served by this permit application Unchanged
- E. Total Residential Equivalent Units (REUs) ultimately served by entire project Unchanged
- F. Water flow rates for proposed project based on REUs listed in "D" and "E" above
- | | |
|--|--------------------------------------|
| 1. Initial design average day flow (mgd) | <u>Unchanged</u> |
| 2. Initial design maximum day flow (mgd) | <u>Unchanged</u> |
| 3. Total design average day flow (mgd) | <u>Unchanged</u> |
| 4. Total design maximum day flow (mgd) | <u>Unchanged</u> |
| 5. Required fire flows: ⁽¹⁾ | <u>Unchanged</u> gpm for _____ hours |
- G. Actual flows and pressures of existing system at the connection point(s) ⁽²⁾
- | | |
|------------------|------------------|
| <u>Unchanged</u> | gpm at _____ psi |
| <u>Unchanged</u> | gpm at _____ psi |
| <u>Unchanged</u> | gpm at _____ psi |
| <u>Unchanged</u> | gpm at _____ psi |
- H. Estimated minimum flows and pressures within the proposed water main system ⁽³⁾
- | | |
|------------------|------------------|
| <u>Unchanged</u> | gpm at _____ psi |
|------------------|------------------|

(1) Every water system must decide what levels of fire fighting flows they wish to provide. Fire flow should be appropriate for the area (residential, commercial, industrial) being served by the project. Typical fire flow rates can be obtained from the water supply, local fire dept., ISO or AWWA. The water system must then be designed to be able to provide the required fire flows while maintaining at least 20 psi in all portions of the distribution system.

(2) Flows and pressures at the connection points must be given to determine if the existing water main(s) are able to deliver water to the new service area. These numbers can be obtained from a properly modeled and calibrated distribution system hydraulic analysis or hydrant flow tests performed in the field. If more than one connection is proposed, list as needed.

(3) List what the estimated minimum flows can be expected in the proposed water mains based on estimated water demands, head losses, elevation changes and other factors that may affect flows, such as dead end mains.

DEQ
RESOURCE MANAGEMENT DIVISION

OCT 19 2012

LANSING DISTRICT

PROJECT MANUAL
FOR
TORREY ROAD BOOSTER STATION
CITY OF FLINT
CONTRACT NO. 2
DWRP No. 7310-01

OWNER: CITY OF FLINT
1101 S. SAGINAW STREET
FLINT, MI 48502

ENGINEER: ROWE Professional Services Company
P.O. BOX 3748
FLINT, MI 48502
810/341-7500

PROJECT NUMBER: 05C0234

DATE: MAY 2012

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 121073 NOV 02 2012

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1976

4FP

CITY OF FLINT

PROJECT MANUAL FOR
CONSTRUCTION OF
TORREY ROAD BOOSTER STATION
CONTRACT NO. 2
DWRP No. 7310-01

PROJECT NUMBER 05C0234

The specifications and other contract documents have been prepared under the direction of the following design professional licensed by the State of Michigan.



Douglas A. Scott, P.E.
Professional Engineer No. 42673



[Seal]

The plans, specifications and contract documents have been reviewed by _____ and final copies released on _____.



SECTION 40 33 00
VALVES

PART 1 - GENERAL

1.01 Work Included

This work includes furnishing of valves, four inches and larger, as shown on the drawings, except for those covered by plumbing.

This work includes providing the complete valve assembly, including operators, wall thimbles, anchor bolts, operating stems, stem guides, operators, and stands; all properly designed for operation with the valve(s) supplied and installed. Wiring to motor actuators and limit switches shall be furnished and installed in accordance with the specifications for electrical work. Valves furnished under this section of the specifications shall be installed as provided under the work of pipework.

1.02 Related Work

A. Section 40 23 00 Pipework

1.03 References

- A. ANSI A21.11/AWWA C111 – Rubber gaskets for cast iron pipe and fittings
- B. AWWA C504 – Rubber Seated Butterfly Valves
- C. AWWA C507 – Ball valves, 6 in. through 24 in.
- D. AWWA C508 – Swing Check Valves for Waterworks Service, 2 in. through 24 in.
- E. AWWA C509 – Resilient Seated Gate Valves for Water Supply Service
- F. ANSI B16.1 – Cast Iron Pipe Flanges and Flanged Fittings
- G. ASTM A126 – Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings

1.04 Submittals

A. Shop Drawings

Valves shall be shown on the pipework drawings. The drawings shall clearly show the orientation of the valve and actuator.

B. Submittal Data

The Contractor shall submit manufacturer's drawings and specifications for the actual models proposed to be supplied. Where the contract documents require that materials meet certain standards or testing requirements, the manufacturer shall provide certification that the standards or testing requirements have been met.

1.05 Installation of Valves

Valves shall be installed in accordance with the requirements of the PIPEWORK section.

1.06 Valve Identification

Each valve shall be provided with a 1 1/2 inch diameter tag with 1/2 inch high letters or numbers identifying each, according the valve schedule.

Tags shall be fabricated from either 18 gauge polished brass or aluminum. Numbers and letters shall be engraved, filled with black paint. Tags shall be fastened to the valve with No. 16 brass jack chain.

PART 2 - MATERIALS

2.01 Solid Wedge Gate Valves (through 16 inch)

Resilient seated solid wedge gate valves shall be furnished and installed and shall be manufactured in accordance with the latest AWWA Standards C-509 and C-515.

Valves shall be Non Rising Stem (NRS) type for buried service or Outside Screw and Yoke (OS&Y) for plant service installations. Valves furnished under these specifications, shall be of the solid wedge, resilient seat type with ductile iron thick wall ASTM A536 grade 65-45-12 body and wedge, and stainless steel stem. Valves sizes 2" thru 12" shall be designed for 200 pounds per square inch working pressure. Valves 14" thru 16" shall be designed for 150 pounds per square inch working pressure. All gate valves shall be tested hydrostatically to twice the rated working pressure.

The wedge shall be ductile iron encapsulated with EPDM elastomer and shall provide a positive water tight seal when closed.

Valve stems shall be 304 stainless steel. The stem nut shall be cast aluminum bronze. Fasteners shall be corrosion resistant steel or stainless steel. Non-rising stem gate valves shall be equipped with three (3) "O" ring type shaft seals properly located in machined grooves in the shaft. OS&Y valves shall have non asbestos graphite packing. The entire internal and external valve body surfaces shall be coated with a factory applied NSF-61 approved fusion bonded epoxy to a minimum of 12 mil thickness. The seating surface shall be constructed to provide a smooth, even surface for the resilient seat to seal on. All valves shall have a ductile iron 2-inch square wrench nut or hand-wheel as shown in the plans.

Port areas of the valves shall be 100% of full pipe flow.

Solid wedge gate valves shall be provided with an actuator of the type shown on the plans or in the valve schedule.

Acceptable manufacturers for solid wedge gate valves are;

- a. J & S Valve
- b. Engineer Approved Equal

2.02 Swing Check Valves

Check valves shall be iron body, bronze mounted, full opening, swing clapper type with either screwed, flanged, or mechanical joint ends as shown on the plans or in the valve schedule. Flanged

valves shall be faced and drilled to the ANSI 125/150 lb. standard. Mechanical joint ends shall be to the AWWA standard C111. Screwed ends shall be to the NPT standard.

Check valves may be either the lever and weight or the spring type, unless one is specifically called for on the plans or on the schedule.

Check valves shall meet the requirements of AWWA C508.

Acceptable manufacturers for swing check valves are:

- a. APCO / DeZurik
- b. Engineer Approved Equal

2.03 Butterfly Valves / Actuated Valves

Butterfly valves 3 - 20" shall meet or exceed the latest revision of AWWA Standard C504 for Class 150B butterfly valves and shall meet or exceed the requirements of this specification. Valves 12" and smaller shall have a working pressure of 200 psi. All valves shall be tested at and shall be capable of withstanding bi-directional line hydrostatic test pressures up to 225 psi without leaking.

Valve bodies shall be of cast iron per ASTM A126 Class B. Flange end valves shall be of the short body design with 125 lb. flanged ends faced and drilled per ANSI B16.1 standard for cast iron flanges. Mechanical Joint end valves shall meet the requirements of AWWA C111/ANSI 21.11.

Discs shall be offset to provide an uninterrupted 360 degree seating edge and shall be cast iron per ASTM A48, Class 40C. The disc seating edge shall be solid 316 stainless steel. The disc shall be securely attached to the valve shaft utilizing a field removable/replaceable 316 stainless steel torque screw on sizes 3 - 12" or a tangential pin locked in place with a set screw on sizes 14 - 20".

Valve shaft shall be type 304 stainless steel. Valve shaft seals shall be self-compensating V-type packing with a minimum of four sealing rings.

The seat shall be of Buna-N for water and shall be molded in and vulcanized to the valve body. The seat shall contain an integral shaft seal protecting the valve bearings and packing from any line debris.

Valve shaft bearings shall be non-metallic and permanently lubricated.

Exterior and interior metallic surfaces of each valve shall be shop painted per the latest revision of AWWA C504. The interior of the body shall have a full rubber lining vulcanized to the valve body. Mechanical Joint valves shall be fully rubber lined to point of pipe insertion.

If the actual valve operating conditions are provided within this specification, the valve actuator shall be sized to the specified conditions. If actual operating conditions are not provided within this specification, per AWWA C504, the valve actuator shall be sized to operate the valve at the rated working conditions of the valve. Each valve and valve actuator shall be assembled, adjusted, and tested as a unit per the latest revision of AWWA C504, by the valve manufacturer.

Ten position locking levers shall be available for 3 - 8" valves. Provision must be made for locking in any of the ten positions using a standard padlock.

Valves 3 - 20" shall have traveling nut manual actuators designed and tested per the requirements of AWWA C504. Housings shall be cast iron and shall be available in both weatherproof and buriabale

constructions with handwheel, chainwheel, or 2" square AWWA nut inputs. All units shall have independently adjustable open and closed position stops that are adjustable under full line pressure and flow - open and closed position stop adjustments shall not require the removal of any load or torque transmitting components.

Pneumatic and hydraulic cylinder actuators shall be double acting, stationary mounted, with all working parts totally protected within weatherproof enclosures. Actuators must be in total conformance to AWWA C540, when specified.

The control valves and actuators shall be provided by the same supplier. The valves shall be factory tested with the matching actuator.

Acceptable manufacturers for control valves are:

- a. DeZurik BAW
- b. Engineer Approved Equal

PART 3 - EXECUTION

3.01 Installation

Valves shall be installed as described in the specifications for PIPEWORK.

PART 4 - VALVE SCHEDULE

Location	Type	Service	Quantity	Size	Joint	Operator	Accessories
Torrey Road Booster Station (8")	SWG	W	1	8	FJ	HW	
	BF	W	1	8	FJ	HW / M	Actuator
	BF	W	1	8	FJ	HW	
Torrey Road Booster Station (12")	SWG	W	1	12	FJ	HW	
	BF	W	1	12	FJ	HW / M	Actuator
	BF	W	1	12	FJ	HW	

EPV - Eccentric plug valve
 SCV - Swing check valve
 SWG - Solid wedge gate valve
 BV - Ball valve
 ABV - Actuated ball valve
 BF - Butterfly valve

WW - Wastewater
 W - Water
 FJ - Flanged joint
 MJ - Mechanical joint
 GL - Glued

HW - Handwheel
 WN - Wrench nut
 L - Lever
 CH - Chainwheel
 M - Motor
 VB - Valve box
 GW - Gate well

END OF SECTION

SECTION 40 33 10
ELECTRIC VALVE ACTUATORS

PART 1 - GENERAL

1.01 Work Included

This work includes furnishing of electric valve actuators for use on butterfly valves. The actuators for valves shall be provided with the valves as a complete package. Refer to valve specification for valve requirements.

1.02 Submittals

A. Submittal Data

The Contractor shall submit manufacturer's drawings and specifications for the actual models proposed to be supplied. Where the contract documents require that materials meet certain standards or testing requirements, the manufacturer shall provide certification that the standards or testing requirements have been met.

1.03 Quality Assurance

In order to ensure quality and compatibility of the equipment, the valves and actuators shall be provided through the actuator supplier. The units shall be shipped together after passing a certified factory test for compatibility.

PART 2 - MATERIALS

2.01 General

The actuators shall be suitable for use on a nominal 480 or 460 volt, three-phase, 60 Hertz power supply and are to incorporate motor, reduction gearing, valve stem drive nut / bushing, position limit switches, mechanical overload torque switches, ductile iron gear case and automatic declutchable hand wheel.

It shall be possible to carry out the setting of the torque, turns, and configuration of the indication contacts without the necessity to remove any electrical compartment covers.

2.02 Gears

Motor speed reduction shall be by means of a gear train consisting of hardened steel spur gears and self-locking worm and worm gear set. The worm shall be heat treated alloy steel and have worm thread surface rolled or ground. The worm gear shall be bronze. Non-metallic gears in the power train are not acceptable.

2.03 Rotating Components

All gearing and shafting shall be supported on antifriction bearings. All thrust components shall be supported by use of tapered roller bearings.

2.04 Handwheel Drive

The actuator shall be furnished with a handwheel located in a 90 degree plane from the actuator output drive, with a maximum rim pull requirement of 60 pounds for valve travel loads. An external manual declutch lever shall be included to place actuator in the manual mode. The lever shall not require more than a 10 pound force to engage even when the valve has been tightly seated. The lever is to be padlockable in either handwheel or motor mode. Operation by motor shall not cause the handwheel to rotate, or operation of the hand wheel shall not cause the motor to rotate. Handwheel shall operate in the clockwise direction to close.

2.05 Lubrication

All gearing and bearings shall be grease lubricated and suitable for year-round service based on prevailing ambient temperature conditions.

2.06 Electric Motors

Electric motors shall be specifically designed for valve actuator service, and be totally enclosed, nonventilated. The enclosure shall meet Nema 4 (weatherproof), Nema 6 (submersible), or Nema 7 (explosionproof), as required for the project. Motor shall be capable of operation under maximum specified loads when voltage to the motor is $\pm 10\%$ of the nominal voltage. Motor shall have Class F insulation with thermal overload sensors imbedded in the motor windings.

2.07 Limit Switches

Limit switches shall be geared to the drive mechanism and in step with actual valve position at all times, whether operation is by power or manual mode. Switches shall be activated by a rotor type design. Contacts shall be silver and have a rating of 10 amps at 120 VAC. A minimum of (3) N.D. and (3) N.C contacts shall be provided for each direction of travel. The limit switch gear mechanism shall be enclosed to prevent entrance of foreign matter or wire entanglement. Use of cams or screws to set switches or designs requiring battery back-up methods to ensure position control in the event of a power failure, are unacceptable.

2.08 Torque Switches

The actuator shall include an adjustable torque switch to interrupt the motor power circuit when an obstruction is encountered in either direction of travel or when torque seating of valves is required for tight shut off. The torque switch shall have a calibrated dial for adjustment and have means to ensure maximum actuator rating is not exceeded. Contacts shall be same construction and rating as limit switch. Mechanical torque springs for load control shall be field replaceable without need of actuator dismantling or removal of the worm assembly.

2.09 Position Indication

Local position indication for quarter valves shall be by indicator dial located on the gear operator and graduated in 25 percent increments. For rising stem multi-turn actuators a dial window indicator shall be located on the limit switch compartment cover and labeled 0 to 100% open and graduated in 5 percent increments. If remote position indication is specified, this shall be by means of a 1000 ohm potentiometer in step with valve position at all times whether operation is electrical or manual.

2.10 Electrical Controls

As a minimum, the actuator shall be furnished with power and control terminal strips, space heater (25 watt), limit switches, torque switches, all housed in a control compartment meeting Nema 4 (weatherproof), Nema 6 (submersible), or Nema 7 (explosionproof), as specified for the project. The rectangular enclosure shall have a bonded O-ring seal and a hinged cover. Cover bolting shall be captive stainless hex head screws.

When built-in controls are specified they shall be an integrated modular package, completely wired and be easily removable or replaceable, as a complete package, by removal of four (4) captive screws. Motor leads and power supply leads will be terminated to the terminal strips located on the modular package. Power supply terminals (5 points minimum) and control supply terminal (48 points minimum) shall be physically isolated from each other to protect against transient voltages. The terminal strips shall be completely shrouded with high impact resistant plastic to avoid accidental terminal contact by personnel. The module is to include a snubber circuit to provide control voltage protection for switches and electronic modules from voltage surges. All electrical components of the modular package, such as reversing contactor, transformer, etc., shall be unidirectional plug connected to provide easy removal and replacement without concerns for proper wiring connections. All optional control requirements such as modulating control, 2-wire control, interposing relays, etc. shall be plug-in printed circuit type boards having gold plated contact connectors. Unless otherwise specified, all PC boards must be temperature rated -40° to $+70^{\circ}\text{C}$. Ease of replacement or upgrading shall be of paramount consideration.

2.11 Open-Close Service Controls

Open-Close Service Controls shall include as a minimum:

- A. **Reversing Contactor** Control voltage shall be 120 volts, 60 or 50 Hz. N.O. Seal-in contacts for momentary contact pushbutton control and N.C contacts for electrical interlock shall be supplied. When specified, additional auxiliary contacts (1 N.O. and 1 N.C for open and close coils) shall be supplied. The contactor shall be both electrically and mechanically interlocked. It shall be completely wired as an assembly and plug connected to the modular package.
- B. **Control Power Transformer** The transformer assembly shall provide 115, 18 and 12 Vac. It shall be epoxy impregnated and encapsulated to prevent moisture incursion and shall be completely wired as an assembly and plug connected to the modular package.
- C. **Pushbuttons** Each actuator shall be supplied with open-stop-close pushbuttons furnished integrally mounted. Pushbuttons shall be double a-ring sealed and include a protective silicon boot. Seal material shall be resistant to ozone and ultraviolet light. When integrally mounted pushbuttons are specified, the design shall permit operation of the buttons when the electrical enclosure cover is open.
- D. **Indicating Lights** The actuator shall include a two (2) long life-high intensity LED type pilot lights to indicate open, closed and intermediate valve position (both lamps on). Red shall indicate valve open and green shall indicate valve closed. An additional LED pilot light shall be furnished to indicate power is on. A fourth LED pilot light shall be furnished to indicate torque switch trip.
- E. **Selector Switch** The actuator shall include a 3-position selector switch, for local (hand)-off-remote (auto) control. If specified the switch shall be padlockable in any position. A tumbler keylock option may be specified.

2.12 Positioning Control Service

Positioning control service providing up to 600 starts per hour with positioning accuracy to $\pm 1.0\%$ dependent on valve operating time, shall include, in addition to the Open-Close controls:

- A. **Comparator Circuit** The comparator circuit shall be a solid state plug-in PC board to accept a 4-20mA input control signal from a position controller and have zero, span and deadband adjustments. The circuit shall provide, as standard, a 4-20mA output signal for remote position indications. Both input and output signals shall be optically isolated. The circuit shall include a jumper selectable setting to Remain-In-Last Position or Close on Loss of control signal.
- B. **Feedback Potentiometer** A valve position feedback potentiometer shall be included and shall be mechanically connected to the valve stem and in step with valve position at all times whether the unit is being operated electrically or by handwheel.

2.13 Startup

Each actuator shall be supplied with a startup kit comprising installation instruction, electrical wiring diagram, and sufficient spare cover screws and seals to make good any site losses during the commissioning period.

2.14 Performance Test Certificate

Each actuator must be performance tested and individual test certificates shall be supplied free-of-charge. The test equipment should simulate a typical valve load and the following parameters should be recorded:

- A. Current at maximum torque setting
- B. Torque at maximum torque setting
- C. Flash Test Voltage
- D. Actuator Output Speed or Operating Time

In addition, the test certificate should record details of specification, such as gear ratios for both manual and automatic drive, closing direction, and wiring diagram code number.

2.15 Acceptable Manufacturers

EIM Controls Series 2000/MCP available through Kennedy Industries, Inc. (248) 684-1200 attention Nick Heintz.

PART 3 - EXECUTION

3.01 Installation

Actuators shall be installed in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 44 42 56.5
AXIALLY SPLIT HORIZONTAL PUMPS

PART 1 - GENERAL

1.01 Work Included

This work includes furnishing labor, equipment, and materials necessary to provide single stage, double suction, horizontal split case pumps as described herein and shown on the plans. This work includes all pipework and electrical work as necessary for complete installation of the pumping equipment.

1.02 Submittals

A. Submittal Data for Review

The Contractor shall submit copies of the manufacturer's technical information on the proposed pumping systems to the Engineer for review. The submittal information shall include copies of the pump operating curve(s).

B. Operation and Maintenance Data

Submit operating and maintenance data in accordance with Section 01 78 23.

1.03 Start-Up

The manufacturer shall provide the services of a factory trained technician to inspect the installation of the equipment furnished and installed under this section of work prior to placing it in operation. The representative shall witness the initial start up of the equipment and make such tests as might be necessary to verify proper operation.

The technician shall furnish the Engineer with a written report of the installation check and startup testing. Any deficiencies shall be specifically noted.

1.04 Operating Conditions

Pumps furnished under this section shall meet the requirements shown on the pump schedule. Pump motors shall be sized to be non-overloading at all points on the performance curve. For this purpose, non-overloading is considered as BHP less than 85% of the motor nameplate horsepower multiplied by the motor service factor.

PART 2 - MATERIALS

2.01 Double Suction/Axially Split Horizontal Pumps

A. Acceptable Manufacturers

1. Patterson Pump Company
2. Engineer Approved Equal

2.02 Materials

A. Pump Casing

1. Pump casing shall be of close grain cast iron type ASTM A48, class 40, designed for heavy-duty service. The casing shall be horizontally split; single volute type with the suction and discharge flanges cast integrally with the lower half in order that the upper part may be removed for inspection of the rotating element without disturbing pipe connections or pump alignment. Pump mounting feet are to be cast integrally into the lower half casing with the mounting surface completely machined. The joint between halves of the casing shall be heavily flanged and bolted, and provided with dowel pins to insure accurate alignment. The upper half-casing flange shall have tapped holes for jackscrews. The interior shall be smooth and free from surface defects.
2. Thickness, diameter and drilling dimensions of suction flanges shall be Class (125) (250) ANSI standard. Discharge flanges shall be Class (125) (250) ANSI standard. Casings shall be drilled and tapped for vertical priming, gauge, and drain connections. Suitable lifting lugs or eyebolts shall be provided.

B. Impeller

1. Impeller shall be of the double suction enclosed type made entirely of ASTM B584-836 bronze finish smooth all over and of ample strength and stiffness for maintaining the maximum capacity of the unit.
2. It shall be statically and dynamically balanced and shall be keyed to the shaft and securely held in axial position on the shaft by means of ASTM B505-954 bronze sleeves extended through the stuffing box. Rotation of the shaft sleeves shall be prevented by the impeller key, which shall extend beyond the impeller hub and into the shaft sleeve on both sides of the impeller. Shaft sleeves shall be held in position by a locking shaft sleeve nut located outside of the stuffing box and shall have an O-ring seal between the sleeve and the nut to prevent entrance of air or liquid between the shaft and sleeve. Sleeves, which are threaded on to the pump shaft, are not acceptable.

C. Wear Rings

1. At the running joint between the suction and discharge chambers, there shall be provided wear rings on both the casing and impeller.
2. The casing rings shall be of ASTM B505-927 bronze, positioned in the casing and locked against rotation by the upper half of the case.
3. Impeller rings shall be of ASTM B505-932 bronze, so fastened that they cannot rotate or become loose when the pump is subjected to reversed rotation. The rings shall be made to limit gauges, so that they may be renewed without fitting.

D. Pump Shaft

1. The shaft shall be of AISI 1141 and of such dimensions that the maximum combined stress due to bending and torsion shall not exceed 8,000 pounds per square inch under the most severe conditions of operation.

2. The shaft shall be accurately machined over its entire length. The first critical speed of the rotating assembly shall occur at not less than 150% of the rated speed.
3. Threads on the pump shaft shall be located outside of the stuffing box.

E. Stuffing Boxes (Packed)

1. Stuffing boxes shall be water sealed, and shall be designed to insure tight packing without excessive wear or friction on the shaft, and to prevent air leakage into the pump under all conditions of operation.
2. Glands shall be of ASTM B584-836 bronze, shall be the split type, and shall be held in place by swing gland bolts. Each stuffing box shall contain a replaceable ASTM B505-932 bronze bushing at the inboard end, a teflon lantern ring at least two packing rings in length, and at least 5 packing rings.
3. Drip pockets, which are cast integrally with the lower half of the pump casing shall be provided under glands and shall have tapped drains for taking care of leakage. Suitably valved connecting lines or passages shall be provided on the upper half casing leading from the discharge volute to the stuffing box for lubricating the stuffing boxes with the liquid being pumped.

F. Stuffing Boxes (Mechanically Sealed)

1. Stuffing boxes shall be provided with mechanical shaft seals.
2. Stuffing boxes shall accept packing or mechanical seals without modification to the stuffing box.
3. Mechanical seals shall be furnished with a carbon seal ring, ceramic mating ring, viton elastomers and 316 stainless steel metal parts.
4. Mechanical seals shall be rated for 250 PSIG pressure. The elastomers shall be rated for temperatures ranging from -20 degrees F to 400 degrees F.
5. Pump shaft sleeves shall be furnished with a pre-machined groove designed to accept a setting ring, which shall eliminate the need for set collars or stop collars. Seals requiring stop or set collars with set-screws are not acceptable.
6. The rotating seal ring shall be provided with a 360 degree rubber encasement to provide a positive drive for the seal face without the need for metal drive notches which may cause face distortion or notch wear. The seal rings shall be permanently fixed in place and full flatness maintained by a precision crimp in the outer seal case.
7. The mechanical seal shall be of a convoluted design which permits free movements providing constant adjustment for shaft endplay and seal face wear. Positive face contact with the stationary seat shall be maintained at all times.
8. To ensure positive sealing by free movement of the seal head, the seal shall feature a hex style outer shell and drive band which shall absorb start-up and running torque and shall eliminate in stress on the diaphragm. Metal components shall freely engage and shall not be subject to lock down due to friction wear.

9. Suitably valved connecting lines or passages shall be provided on the upper half casing leading from the discharge volute to the stuffing box for lubricating the stuffing boxes with the liquid being pumped.

G. Bearings

1. Bearings shall be of the anti-friction type grease lubricated ball.
2. The bearing configuration shall consist of one single row deep grooved anti-friction bearing on the inboard side and two single row deep grooved anti-friction bearings mounted back to back on the outboard side. The inboard bearing shall be designed to take the radial thrust loads. The outboard bearings shall be designed to take a combination of loads, both radial and axial; and hold the rotor in axial alignment.
3. Bearings shall have a minimum rated service life of 40,000 hours in accordance with the standards of the Bearings Manufacturers Association throughout the specified operating range. Bearings shall be mounted in dust tight housings shall be rigidly supported by suitable brackets, which shall be cast with integrally with the lower half of the pump casing. Bearing housings or bearing housing supports, which are bolted to the side of the pump casing, are not acceptable.
4. A deflector made of Aluminum shall be provided on the inboard and outboard ends of the pump shaft to prevent product from entering either bearing housing.

H. Pump Base

1. The pump and motor shall be mounted on a common base of fabricated ASTM A36 steel. Bent metal or formed bases are not acceptable.
2. The base shall be provided with a coupling guard, and ample grout holes. (Drip lip rim available on request.)
3. All mounting surfaces shall have a machined finish.

I. Couplings

1. The coupling shall be Martin Quadra-flex or approved equal with type S flanges and elastomeric sleeves of Hytrel, EPDM or similar material.
2. Sized to transmit the maximum required horsepower with a 1.5 service factor.

J. Motor

1. The motor shall be sized by the manufacturer to operate the pump without overload along the entire pump curve. The motor shall be properly insulated to be compatible with variable frequency drives.

2.03 Factory Testing

- A. Each pump shall undergo a certified hydrostatic test at 150% of the pressure developed at shut-off head.

- B. A certified performance test shall be performed on each unit utilizing its specified drive. If variable frequency drives are specified, one drive of each rating shall be shipped to the pump manufacturer's plant for testing as a complete unit.
- C. All tests shall be performed in accordance with the Hydraulic Institute Test Standards for Centrifugal Pumps - 1.6 (1988).
- D. Six evenly spaced test points shall be taken and shall include conditions at shut-off (zero flow) and the operating points specified herein. Preliminary test data must be submitted to the owner seven days prior to the actual test date.
- E. The engineer and/or a representative of the owner shall be given sufficient notice of the testing dates and shall have the opportunity to witness these test.

2.04 Warranty

- A. The manufacturer of the pumping units shall provide a written warranty covering the entire pumping unit.
- B. The warranty shall be in effect for a period of one year after final acceptance or 18 months after the original ship date, whichever expires first.

PART 3 - EXECUTION

3.01 General Installation Requirements

The Contractor shall install pumps and related accessories substantially as shown on the drawings. Installation shall conform to the requirements of the pump manufacturer.

3.02 Startup

The pump manufacturer shall furnish a factory trained technician to check the installation shall be present to place the station in initial operation and instruct regular operating personnel in the proper care and maintenance of the station at no additional cost to the Owner. The Owner may elect to have the factory technician return within 90 days to re-adjust operation of the station at no cost to the Owner.

END OF SECTION

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS
(CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

ENTERED

This application becomes an Act 399 Permit only when signed and issued by authorized DEQ Staff.
See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint Water Service Center 3310 East Court Street Flint, MI 48506 WSSN: 2310	Permit Stamp Area (DEQ use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMITS W 121072 NOV 01 2012 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976 MEP	
2. Owner's Contact Person (provide name for questions): Contact: Brent Wright Title: Water Treatment Plant Supervisor Phone: 810-787-6537		
3. Project Name (Provide phase number if project is segmented): Cedar Street Pump Station Improvements Contract No. 3	4. Project Location (City, Village, Township): City of Flint	5. County (location of project): Genesee County

ISSUED UNDER THE AUTHORITY OF THE ~~DEQ~~ DIRECTOR OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY
RESOURCE MANAGEMENT DIVISION

cc:

OCT 19 2012

LANSING DISTRICT

Issued by:

Michael P. Pappas

Reviewed by:

MEP

☐ If this box is marked see attached special conditions.

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the Michigan Department of Environmental Quality District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.

CONTINUE APPLICATION ON THE FOLLOWING PAGES



WATER BUREAU

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions will be returned. SEE EXAMPLES BELOW. Use additional sheets if needed.

The project consists of electrical modifications at the Cedar Street Pump Station including the following:

Replacement of the existing switch gear
 Installation of soft starts on pumps 1 and 2
 Installation of generator connection box. The standby generator is not included in this project.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.



OHIO DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER BUREAU

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address:

Jeff B. Markstrom, P.E.
 Rowe Professional Services Company
 4400 S. Saginaw St, Suite 1200
 Flint, MI 48507
 (810)341-7500 jmarkstrom@rowepsc.com

8. Indicate who will provide project construction inspection:

- ☐ Organization listed in Box 1.
☒ Engineering firm listed in Box 7.
☐ Other - name, address, and phone number listed below.

9. Is a basis of design attached?

☐ YES ☒ NO

If no, briefly explain why a basis of design is not needed. Replacement of Existing Electrical Components Only

10. Are sealed and signed engineering plans attached?

☒ YES ☐ NO

If no, briefly explain why engineering plans are not needed.

11. Are sealed and signed construction specifications attached?

☒ YES ☐ NO

If specifications are not attached, they need to be on file at DEQ.

12. Were Recommended Standards for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed?

☒ YES ☐ NO

If no, explain which deviations were made and why.

13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved?

☒ YES ☐ NO

If no, describe what coatings, additives or materials did not meet the applicable standard and why.

14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement?
 (For projects not located in the public right-of-way, utility easements must be shown on the plans.)

☒ YES ☐ NO

If no, explain how access will be obtained.

15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451?

☐ YES ☒ NO

If yes, a wetland permit must be obtained.

16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules?

☐ YES ☒ NO

If yes, a flood plain permit must be obtained.

17. Is the project construction activity within 500 feet of a lake, reservoir, or stream?

☐ YES ☒ NO

If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER BUREAU
 Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?

☐ YES ☒ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☐ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES ☒ NO

If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) City of Detroit

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☒ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DEQ.

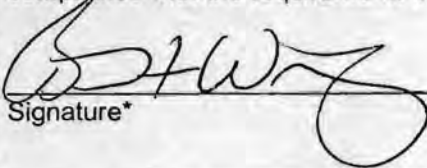
21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, BRENT F. WRIGHT (name), acting as the PLANT SUPERVISOR (title/position) for

CITY OF FLINT (entity owning proposed facilities) certify that this project has

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.


Signature*

5-24-12
Date

810-787-6537
Phone

*Original signature only, no photocopies will be accepted.



CHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER BUREAU
 Permit Application for Water Systems (Continued)

PROJECT BASIS OF DESIGN – FOR WATER MAIN PROJECTS

PROJECT NAME: _____

For this PROJECT the following information must be provided per Act 399 unless waived by the Department. For projects other than water main installation, or if additional space is needed, attach separate sheet(s) with detailed Basis of Design calculations.

- A. A general map of the initial and ultimate service areas
☐ Included on engineering plans ☐ Attached separately
- B. Number of service connections served by this permit application _____
- C. Total number of service connections ultimately served by entire project _____
- D. Residential Equivalent Units (REUs) served by this permit application _____
- E. Total Residential Equivalent Units (REUs) ultimately served by entire project _____
- F. Water flow rates for proposed project based on REUs listed in "D" and "E" above
1. Initial design average day flow (mgd) _____
 2. Initial design maximum day flow (mgd) _____
 3. Total design average day flow (mgd) _____
 4. Total design maximum day flow (mgd) _____
 5. Required fire flows: ⁽¹⁾ _____ gpm for _____ hours
- G. Actual flows and pressures of existing system at the connection point(s) ⁽²⁾
- | | |
|--|------------------------|
| | _____ gpm at _____ psi |
| | _____ gpm at _____ psi |
| | _____ gpm at _____ psi |
| | _____ gpm at _____ psi |
- H. Estimated minimum flows and pressures within the proposed water main system ⁽³⁾
- _____ gpm at _____ psi

(1) Every water system must decide what levels of fire fighting flows they wish to provide. Fire flow should be appropriate for the area (residential, commercial, industrial) being served by the project. Typical fire flow rates can be obtained from the water supply, local fire dept., ISO or AWWA. The water system must then be designed to be able to provide the required fire flows while maintaining at least 20 psi in all portions of the distribution system.

(2) Flows and pressures at the connection points must be given to determine if the existing water main(s) are able to deliver water to the new service area. These numbers can be obtained from a properly modeled and calibrated distribution system hydraulic analysis or hydrant flow tests performed in the field. If more than one connection is proposed, list as needed.

(3) List what the estimated minimum flows can be expected in the proposed water mains based on estimated water demands, head losses, elevation changes and other factors that may affect flows, such as dead end mains.

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS
 (CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Natural Resources and Environment (DNRE) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint 3310 East Court Street Flint, MI 49502 WSSN: 02310-8	Permit Stamp Area (DNRE use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 1032 MAY 17 '11 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976 MFP	
2. Owner's Contact Person (provide name for questions): Contact: Michael Brown Title: Utilities Administrator Phone: 810-766-7202	4. Project Location (City, Village, Township): City of Flint	5. County (location of project): Genesee
3. Project Name (Provide phase number if project is segmented): Smith Village Redevelopment		

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

cc:

Issued by:

Michael Presby

Reviewed by: _____

☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DNRE District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DNRE permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions will be returned. SEE EXAMPLES BELOW. Use additional sheets if needed.

Project consists of removing existing 4" water main and replacing it with 8" water main. The Flint water model has been updated to confirm the proposed pipe diameter increase. See below for water main lengths and locations.

Chipewa Street from Louisa to Wood = 1718 ft of 8" water main.
 Root Street from Louisa to Mary = 2142 ft of 8" water main.
 Avenue A from Louisa to Mary = 2158 ft of 8" water main.
 Avenue B from MLK to Mary = 1917 ft of 8" water main.
 Avenue C from Williams to Crosby = 1034 ft of 8" water main.
 Donald Street from Wood to Mary = 510 ft of 8" water main.
 Crosby Street from MLK to Avenue C = 850 ft of 8" water main.
 Wood Street from MLK to Saginaw = 2365 ft of 8" water main.
 Louisa Street from MLK to Saginaw = 1160 ft of 8" water main

Total 8" Water Main = 13,854 Ft

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
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Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address:

Jeffrey B. Markstrom, P.E.
Rowe PSC
PO Box 3748
Flint, MI 48502

8. Indicate who will provide project construction inspection:

- ☐ Organization listed in Box 1.
☒ Engineering firm listed in Box 7.
☐ Other - name, address, and phone number listed below.

9. Is a basis of design attached?

☐ YES ☒ NO

If no, briefly explain why a basis of design is not needed. The service area of the system is not changing therefore no additional capacity is anticipated.

10. Are sealed and signed engineering plans attached?

☒ YES ☐ NO

If no, briefly explain why engineering plans are not needed.

11. Are sealed and signed construction specifications attached?

☒ YES ☐ NO

If specifications are not attached, they need to be on file at DNRE.

12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed?

☒ YES ☐ NO

If no, explain which deviations were made and why.

13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved?

☒ YES ☐ NO

If no, describe what coatings, additives or materials did not meet the applicable standard and why.

14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement?

(For projects not located in the public right-of-way, utility easements must be shown on the plans.)

☒ YES ☐ NO

If no, explain how access will be obtained.

15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451?

☐ YES ☒ NO

If yes, a wetland permit must be obtained.

16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules?

☐ YES ☒ NO

If yes, a flood plain permit must be obtained.

17. Is the project construction activity within 500 feet of a lake, reservoir, or stream?

☐ YES ☒ NO

If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?

☒ YES ☐ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☒ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☐ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES ☒ NO

If yes, attach a copy of a plan acceptable to the DNRE for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DNRE district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) _____

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☐ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DNRE.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, MICHAEL BROWN (name), acting as the UTILITIES ADMINISTRATOR (title/position) for

(print)

(print)

THE CITY OF FLINT (entity owning proposed facilities) certify that this project has

(print)

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.

[Signature]
Signature

5/10/11
Date

810 766 7302
Phone

*Original signature only, no photocopies will be accepted.


ROWE INCORPORATED

 P.O. Box 3748 • Flint, Michigan 48502
 Phone: (810) 341-7500 • Fax: (810) 341-7573

ENGINEERING • LAND & AERIAL SURVEYING • PLANNING • LANDSCAPE ARCHITECTURE • LAND DEVELOPMENT SERVICES

LETTER OF TRANSMITTAL

 TO: MDEQ
 Constitution Hall
 525 West Allegan Street, P.O. Box 30473
 Lansing, MI 48909-7973

Attn: Mike Prysby

 DATE: May 12, 2011
 JOB NO.: 11c0007
 RE: City of Flint, Smith Village
 Reconstruction
 Shipped via: ☒ UPS Ground ☐ UPS Overnight
☐ US Mail

If shipping via UPS please provide Recipient's Phone No. 517-335-6094

WE ARE SENDING YOU:
☒ Attached ☐ Under separate cover via _____

THE FOLLOWING ITEMS:
☐ Shop drawings ☐ Prints ☒ Plans ☐ Samples
☐ Specifications ☐ Copy of letter ☐ Change Order ☒ Part 41 Permit

COPIES	DATE	NO	DESCRIPTION
3			Water Main Drawings and Specifications for Smith Village Reconstruction
1			Act 399 Permit Application

THESE ARE TRANSMITTED:
☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____ ☐ For Bids due
☐ Prints returned after loan to us

REMARKS:

On behalf of the City of Flint, we are submitting three sets of water main plans and specifications for the Smith Village Reconstruction Project. The project consists of a total reconstruction of the road and all utilities (sanitary sewer, storm sewer and water main) in the Smith Village Subdivision.

We request that you review the attached information for issuance of the necessary construction permit. If you have any questions, please contact us.

Copy To:

Signed:

Michael A. Royalty, P.E.

CITY OF FLINT
SPECIAL PROVISION
FOR
ALTERATION OF MUNICIPAL WATER SYSTEM



ROWE: COF

1 OF 18

MARCH 2011

Description

This work shall consist of installing ductile iron watermain of the nominal diameter shown on the plans. This work includes the furnishing of all labor, equipment, and materials including shop drawings, required for excavation, installation, and backfilling as shown on the plans and specified herein.

A. Grades

All mains are to be laid with a minimum cover of five and 1/2 (5.5) feet unless otherwise shown on plans. This cover is to be from finish grade of the street. All mains are to be laid with a minimum cover of (6) feet under railroad track.

B. Miscellaneous Services from the City/Contractor

The Contractor shall notify the Engineer in writing, with copy of notification to City of Flint Water Service Center Supervisor, a minimum of four full working days prior to work requiring involvement of City of Flint Water Service Center personnel. The contractor shall coordinate all activity related to water main construction with the City of Flint Water Service Center personnel. Costs and time for such coordination and services shall be considered included in the progress schedule and Miscellaneous Watermain Coordination Allowance pay item.

The City will chlorinate or otherwise disinfect the water mains at the expense of the Contractor, payment to be reimbursed through the Miscellaneous Watermain Coordination Allowance pay item.

The City will furnish water for filling the mains for testing purposes. Water will be made available at connections of new mains to existing mains, or at existing fire hydrants. All connections shall be made in a manner and under conditions meeting the approval of the Water Distribution Supervisor. No charge will be made of the Contractor by the City for the use of water for testing purposes. All necessary attachments, devices and pumping for the proper use of such water are to be furnished by the Contractor at his expense, and shall be subject to the approval of the Water Distribution Supervisor.

The Contractor will furnish all tapping valves with sleeves, corporations for chlorination, pressure testing and water services. Contractor will perform all excavation, backfill, compaction, preparation and restoration of the site. The City of Flint will install all pressure taps, taps for chlorination, pressure testing and water services. Contractor shall coordinate the installation provided by the City with City personnel. Contractor shall notify City personnel one week in advance of service and update status as requested.

The City of Flint will make all connections and pressure taps to the existing water main. Contractor will perform all excavation, backfill, compaction, preparation and restoration of

the site. The Contractor will supply all parts and valves as noted on the plans.

The Contractor will remove, salvage and deliver all existing hydrants to the City of Flint (location to be determined at the preconstruction meeting).

The City will provide for water main inspection, and any material testing, at the expense of the Contractor, payment shall be reimbursed with the Contractor Cost for Water main Inspection pay item.

City personnel will perform installation of all service connections from corporation including curb stop and box. Installation of corporations and connections to the existing services (materials provided by Contractor) will be by City of Flint personnel. This work will include all labor by City of Flint personnel to install corporations to the existing and proposed watermain and connect existing service leads. Contractor will perform all excavation, backfill, compaction, preparation and restoration of the site.

C. Storing Materials and Supplies

Materials and supplies, if necessary, may be placed adjacent to the improvement, but ample way for foot traffic must at all times be maintained free from obstruction except with the express permission of the Water Distribution Supervisor. Any damage to the walks or property by reason of such storing of materials must be repaired by the Contractor at his own expense. The Contractor must not (*except after consent from the proper parties*) enter or occupy with men, tools, or materials any land not the property of the City, or land on which an easement or right has not been secured by the City.

D. Convenience to Public

During the progress of the work, the convenience of the public and of residents along the street must be provided for as far as practicable. Convenient access to driveways, houses and buildings along the street must be maintained wherever possible. The sidewalk or crosswalk shall be replaced, after backfilling of the water main, as noted on the plans.

All traffic control and detouring of the streets will be done according to the plans and as specified in the **Special Provision for Maintaining Traffic**.

E. Structures Above Ground

Existing structures above ground such as utility poles, street lighting standards, parking meter supports, hydrants and the like and buildings shall be protected from damage. The Contractor shall be responsible for damage to any structures or fixtures above ground caused by his operations. The Contractor shall also be responsible for damage to existing underground structures caused by his operations as previously specified herein.

F. Fire Hydrants

No material or other obstruction shall be placed within ten feet of existing fire hydrants. *Hydrants shall at all times be readily accessible to the Fire Department.*

G. Rights-of-Way

In general, work under contract that is located in City streets or on City property. Rights-of-way across private property, where required, will be secured by the City without expenses to the Contractor. The Contractor shall hold himself strictly within the rights secured to him by the City in prosecuting the work on private property.

H. Use of Mains before Final Completion

The City shall have the right to make use of such portions of completed acceptably tested mains, during the construction period as they may find practicable. Such use by the City shall not relieve the Contractor from responsibility for any leaks or defective work in such mains and accessories which may develop prior to the final acceptance of all work under this contract.

I. Trees, Shrubs, Etc.

Trees, shrubs, etc., in the line of the water main, will be removed, as noted on the plans.

Materials

A. Concrete

Class A - (*for all structures*)

1: 2: 6: Mix (*Minimum cement per cubic yard of concrete - 1.55 lbs*)

Class B - (*Lean concrete for fill*)

1: 3: 3: Mix (*Minimum cement per cubic yard of concrete - 1.10 lbs*)

All "Class A" concrete shall show a minimum 28 day strength of 3,500 pounds per square inch, and "Class B" concrete, 1,000 pounds, per square inch.

The retempering of concrete which has partly hardened, that is, remixing with or without additional cement, aggregate or water, will not be permitted.

Transit mixed concrete may be used.

In order to obtain clean and firm bearing surfaces, all water and softened material shall be removed from excavations immediately before concrete is deposited. Concrete shall not be deposited in water nor shall water be allowed to rise over the concrete until it has hardened sufficiently to prevent injury thereto. Any flow of water into the excavation shall be diverted through proper side drains to a pump, or by lowering the ground water level by means of pumps or removed by other approved means, which will avoid washing the freshly deposited concrete.

Concrete shall be deposited in accordance with approved practice and in a manner and under conditions which will meet the approval of the Engineer.

The surface of concrete and mortar that will be exposed to the sun or to premature drying after placing shall be kept constantly moist by sprinkling at frequent intervals, or by covering with moist burlap or canvas or by other means equally effective, for a period of seven (7) days after completion. Freshly finished surfaces shall be protected by supported canvas or other protection during rain or storms. A sufficient quantity of canvas or other protection shall be kept ready for this purpose.

B. Reinforcing Steel

Reinforcement steel shall conform to standard specifications for billet bars for concrete reinforcement, intermediate grade, serial designation A15-39 of American Society for Testing Materials.

C. Mortar for Manholes

Mortar for brickwork of manholes and for plastering outside of manholes shall be made of Portland Cement type I, or IA and fine aggregate type 2MS(per MDOT 2003 Standard Specifications for Construction Section 702 & 902). The mortar shall be mixed according to Section 702 of the MDOT Standard Specifications.

D. Brick

Brick for manholes (*Gatewells*) shall be such as will fully meet the requirements of the Standard Specifications for Concrete Brick, Serial designation C-55 of the American Society for Testing Material.

E. Manhole Blocks

Precast blocks for manholes shall meet A.S.T.M. specification C-139.

F. Gatewells

Gatewell (gate valve in manhole) and well structures (check valve in manhole) materials shall be in accordance with Section 403 of the 2003 MDOT Standard Specifications for Construction, and as shown on the plans and detail sheets.

G. Manhole Steps

Manhole steps shall be Clow-F-3659 or approved equal.

H. Pipe

Pipe used in the water distribution system shall be ductile iron pipe centrifugally cast in metal or sand-lined molds conforming to ANSI/AWWA C150/A21.50 and ANSI/AWWA C151/A21.51 as amended to date. Push-on joints, mechanical joints, and/or restrained joints shall conform to ANSI/AWWA C104/A21.4 as amended to date.

<u>DIAMETER</u>	<u>DESIGNATION</u>	<u>THICKNESS</u>
4-inch	Class 54	.35-inch
6-inch	Class 54	.37-inch
8-inch	Class 54	.39-inch
10-inch	Class 54	.41-inch
12-inch	Class 54	.43-inch
16-inch	Class 54	.46-inch
18-inch	Class 54	.47-inch
20-inch	Class 54	.48-inch
24-inch	Class 54	.50-inch

The metal thickness class, net weight of the pipe without lining, the nominal size, and the manufacturers identifying symbol shall be clearly marked on each length of pipe.

Types of pipe and pipe sizes larger than 12-inch shall be specified individually based upon the particular conditions of the specific project. The pipe shall have cement-mortar lining conforming to ANSI/AWWA C104/A21.4 as amended to date. The pipe shall have a push on joint with a single rubber gasket and shall include brass or bronze wedges to permit electrical thawing. Polywrap meeting ANSI/AWWA C105/A21.5-99 for 8 mil Linear Low Density polyethylene encasement is required to cover all underground watermain and appurtenances including service taps and excluding copper service lead tubing.

I. AWWA Body

RESILIENT - SEATED GATE VALVES

A. Scope

This specification covers iron-body resilient-seated gate valves with non-rising stems (*NRS*) from 3" to 12" nominal pipe size.

B. Specific Requirements

i. Standard

The valves covered by this specification shall be in conformance with requirements of the current AWWA Specification C515, Underwriters Laboratories Standards UL262 and Factory Mutual Standard 1130. The Ductile Iron Body, Bonnet, Seal Plate, and Wedge are manufactured from Iron conforming to ASTM A536. The epoxy coating shall be in accordance with ANSI/AWWA C550 and certified to NSF61. The wedge is fully rubber

encapsulated to meet ASTM D429 requirements. The following specifications also apply.

ii. General

Gate valves are to be FlowMaster® Resilient Wedge Gate Vales as manufactured by East Jordan Iron Works.

All valves shall be mechanical joint type with non-rising stems and O ring seal. Valves are to be placed in the vertical position and open to the right (*clockwise*). The valve interior shall be coated with an epoxy.

The manufacturer shall supply catalog data including illustrations and part schedules.

The manufacturer shall furnish the purchaser with an affidavit stating the valve and all materials used in its construction conform to the applicable requirements of this standard and the supplementary specifications and that all tests specified therein have been performed and met.

CHECK VALVES

A. Scope

This specification covers check valves of the approved type.

B. Specific Requirements

i. Standard

The valves covered by this specification shall be in conformance with requirements of the current AWWA Specification and ANSI B16.1 Class 125 rated to a minimum of 250 psi.

ii. General

Check valves shall: be manufactured from gray cast iron meeting or exceeding ASTM A126 Grade B; comply with AWWA C508; allow for clear waterway opening; possess a ductile iron clapper arm conforming to ASTM A536 Grade 65-45-12; possess a disc which does not contact the body when the valve is in full-open position; possess a shaft which is stainless steel with corrosion resistant bearings.

Check valve brand shall be American Flow Control 50-SC swing check valve or approved equal.

TAPPING VALVES AND SLEEVES

A. Scope

This specification covers tapping valves and sleeves of the approved type.

B. Specific Requirements

i. Standard

The valves, hardware and sleeves covered by this specification shall be in conformance with requirements of the current AWWA Specification rated to a minimum of 250 psi.

ii. General

Tapping valves, hardware, sleeves and flanges shall be an approved type, as proposed by Shop Drawing submittal, as manufactured by East Jordan Iron Work for FlowMaster®. Sleeves, flanges, and hardware shall be stainless steel.

IN LINE STOPS

A. Scope

This specification covers in line stops of the approved type.

B. Specific Requirements

i. Standard

The valves covered by this specification shall be in conformance with approved standards as determined by the City of Flint and the Engineer.

ii. General

In line stops are to be the approved type and manufacturer, as proposed by Shop Drawing submittal.

J. Hydrants

1. Scope

This specification covers post-type dry-barrel hydrants.

2. Specific Requirements

A. Standard

The hydrants covered by this specification shall be in conformance with requirements of the current ANSI/AWWA Standard C502 with revisions to date. Hydrants also shall be Underwriters Laboratories Standard UL246 listed and Factory Mutual 1510 approved. The Ductile Iron castings shall be manufactured from iron conforming to ASTM A536, and the following supplemental specifications.

B. General

Hydrants are to be East Jordan Iron Works Model 5BR250, part #55512D.

Hydrants are to be of the *"Breakable"* or *"Traffic Type"* with replaceable components of barrel and stem. The hydrants shall be compression type shut-off which will remain closed in event of accidental damage or breaking of the barrel. The seat valve shall be bronze to bronze material.

Hydrants are to have 5-1/4" inch main valve and 6-inch side inlet. Inlet to have mechanical joint unless otherwise specified on bid sheet. The hydrants shall be provided with a drain or waste outlet which is part of the main valve mechanism; at delivery the drain or waste outlet is to be tapped and plugged.

Hydrants are to have "O" ring packing. The hydrant shall be painted chrome yellow. The top of hydrants shall be painted according to the standard detail sheet in the plans. Hydrants will open to right (clockwise) and the direction of opening shall be clearly shown by an arrow and word *"open"* cast in relief, so as to be clearly visible on the top of the hydrant. Hydrants shall have two 2 1/2 inch hose nozzles and one 4 1/2 inch pumper nozzle with NST threads and caps with chains. Operating and cap nuts are to be square. The square is to measure 7/8 inches across the flats at the base and not less than 3/4 inches at the top. Height of the nut is not to be less than one inch.

Mechanical joint hydrants are to include joining material. Hydrants shall be designed so that extensions to the barrel may be added above ground without excavation. Hydrant design shall be such that no excavation is necessary to remove the main stem and the movable parts of the drain valve.

Trench Details are as noted on the plan sheets. The standard depth of bury (DOB) for a hydrant is 6'0" unless otherwise noted on plans. The contractor will salvage and deliver to the City all existing hydrants. The hydrants shall be painted as noted in the plans (detail sheet).

K. Fittings

1. Scope

This specification covers ductile iron fittings 3 - 48 in. for water.

2. Specific Requirements

a. Standard

The fittings covered by this specification shall be in conformance with requirements of the current AWWA Standard C 153/A21.53 and C 111/A 21.11 and the following supplemental specifications.

b. General

All fittings are to be mechanical joint, cement lined, with a 350 psi pressure rating. When requested, fittings should be supplied to fit over both centrifugally cast and sand cast pipe.

Mechanical joint fittings are to include joining material.

L. Gatewell Rings and Cover

Gatewell castings shall be East Jordan Iron Works No. 1040 with cover type "A", or approved equal. Cover shall contain type "A" legend with the text "WATER" cast on it.

M. Valve Boxes

Valve boxes are to be the EJIW 95E, Bibby 95E, or Tyler 6500 Screw Type, 2-piece, arch pattern for services. Boxes for mains shall be EJIW 8560 series 3-piece with #6 base as specified. Gray Iron will conform to ASTM A48 Class 35B gray iron with cold tar asphaltic dip. Lids shall have the word "water" cast into the lid.

N. Encasement Pipe

Steel pipe where specified for encasement pipe shall be new welded steel pipe and shall meet standards of ASTM 139, Grade B. The pipe shall be 1/4 (.250) inch to 13/32 (.406) inch wall thickness as specified on the plans and special provision if included in bid package.

O. Separator Skids

Skid runners that completely separate casing and carrier pipes shall be utilized. Methods and materials shall be approved by the Engineer.

Where hardwood runners are approved for banding to water carrier pipe, they shall be treated with pentachlorophenol-petroleum solution. The pentachlorophenol-petroleum solution shall consist of not less than 42 percent, nor more than 52 percent of pentachlorophenol dissolved in a heavy petroleum solvent. Then pentachlorophenol and the heavy petroleum solvents shall conform to the requirements of the current specifications for

Timber preservatives, AASHTO Designation: M133.

Pentachlorophenol-petroleum solution may be purchased as a ready-to-use product, or a concentrate to be diluted with the petroleum solvent.

The wood may be pressure treated or may be immersed in the specified pentachlorophenol-petroleum for a period of at least seven days.

P. Anchoring Fitting

When anchoring fittings are specified, they shall conform to the following:

American Double-X or approved equal ductile retainer gland with cap screws.

Clow F-1218 or approved equal special mechanical joint anchoring elbow.

Clow F-1215 or approved equal anchoring coupling.

Clow F-943 or approved equal special hydrant tee.

Megalug series 1100 shall be used for mechanically restrained joints.

- Q. Corporations and Curb Stops and Saddles shall be approved Ford type or similar approved.

Detailed Specifications

A. Scope

Under this item, the Contractor will furnish all labor, pipe, valves, fittings, valve boxes, hydrants, manholes including rings and covers, service leads and any other material necessary for a complete main laying job. All materials and workmanship shall be as approved by the Engineer and City of Flint Water Service Center Distribution Supervisor.

B. Excavation

The locations of existing utilities are shown in accordance with available data. The Contractor shall expose those utilities where required, to determine actual locations. The Contractor shall not disturb nor cut into any existing water mains in service without City of Flint Water Distribution Supervisor's approval.

The Contractor shall explore the street far enough in advance of laying pipe to check exact locations of underground structures, sewers, water mains, services, also gas and electric structures. The Contractor shall contact the Engineer if any adjustments to plan and profile of new water mains are needed to avoid interference with existing structures, and the Contractor shall be responsible for all unnecessary injury to underground structures in the course of his operations.

Trenches for mains shall be excavated so that there will be a minimum net clearance of

twelve inches on each side of the barrel of the pipe. Water main trenches shall be excavated to the lines, grade, and cross-section shown on the plans or to such modifications as may be approved Water Distribution Supervisor, or Engineer to meet or pass existing utility structures. Foreign materials encountered in the trench, such as slabs of wood, boulders, and the like, which obstruct the trench shall be removed with other excavation and where such obstructions occur, at or near the bottom of the trench, requiring excavation below the standard grade. Unnecessary excavation below grade by the Contractor shall be refilled to grade with tamped sand. Excess excavated materials not required in backfilling shall be removed and disposed of by the Contractor. The trench shall be brought back to grade by 1) backfilling to bottom of proposed aggregate base with approved sand meeting the requirements for MDOT Class II granular Material, compacted to 95% of its maximum unit weight at optimum moisture content, and 2) placement of aggregate base as called for on the plans or, as a minimum, place 8 inches minimum depth of 100% crushed limestone meeting the requirements for MDOT dense graded aggregate 21AA, compacted to 98% of its maximum unit weight at optimum moisture content,

Where condition of the ground requires, the sides of trenches shall be securely held by bracing sheeting which may be removed in units when the level of the backfill has reached depth where it is safe to pull the sheeting. No sheeting, bracing or other timber shall be left in the trench upon completion of the main or other structure.

The contractor is required to control the infiltration of groundwater into the excavation. If ordinary methods of drainage such as bailing, pumping, etc., prove unsatisfactory, the contractor is responsible for dewatering.

The bottom of the trench shall be shaped so as to conform as nearly as possible to the outside of the pipe, particular care being taken to recess the bottom of the trench in such manner to relieve the bell of all load.

Where trench must be cut through pavement, driveway, or walk, particular care shall be taken to unnecessarily damage adjoining areas of pavement, driveway or walk. Cuts are to be made with a smooth edge by use of a concrete saw.

Other underground mains, sewers or structures encountered in the excavation shall be adequately supported during the Contractor's operations, and before backfilling of the trench, shall receive a permanent support of lean concrete (*Class B*), extending from the bottom of the trench to the underside of the main or other structure. In lieu of such concrete pedestal support, other approved support may be used satisfactory to the Water Distribution Supervisor.

Small pipes and services encountered in the excavation shall, where deemed necessary by the Water Distribution Supervisor, be properly supported and protected from possible damage by lean concrete (*Class B*) or timber beams of adequate strength extending across the trench into undisturbed ground or by concrete pedestals extending to the bottom of the trench, or by other approved method.

C. Laying Pipe and Fittings

In handling or laying pipe, no metal shall be allowed to come in contact with the inside of the pipe. Care shall be taken not to damage the pipe or pipe coating and no damaged or

imperfect pipe may be used in the work. Minor damage to pipe coating may be repaired subject to the approval of the Water Distribution Supervisor.

Pipe shall be carefully laid in the dry and to line and grade and care shall be taken to keep the interior of the pipe clean and free from dirt and other foreign materials. Rubber gasket plugs or approved bulkhead shall be used for this purpose. Mechanical joint pipe fittings shall be jointed with the bolts, gaskets and follower rings furnished by the pipe manufacturer, and the procedure in making such joints shall be in accordance with manufacturer's instructions and recommendations.

All in line bends, fitting, tees, solid sleeves, reducers, and hydrants shall be encased in 8 mil polyethylene. The polyethylene film tube shall be installed in accordance with ANSI/AWWA C 105/A21.5, Method A. Method A consists of cutting the polyethylene tube 2 feet longer than the pipe to provide an overlap at the joints.

Single-rubber-gasket joint pipe shall be installed according to the manufacturer's instructions and recommendations and is to have the required number of brass wedges installed at all joints for electrical thawing.

At crossings, one (1) full length of water pipe shall be located so both joints will be as far from the sewer crossing as possible, see crossing detail #SD-17W.

D. Backfilling

The Contractor shall backfill the trench according to MDOT Standard Plan R-83(Series), Trench Detail G. This Detail utilizes MDOT class II or IIA granular material, thoroughly tamped in not to exceed twelve (12) inch layers and compacted to 95% of its maximum density. Material excavated from trench shall not be left on the roadway, but shall be trucked away or deposited on the adjoining property if approved by owners of said property. The roadway shall be kept clear at all times of excavated material. Caved material shall be dug out of the trench in the same manner and the entire excavation backfilled with sand as specified above.

Where gravel surfacing in graveled streets, roads or driveways is excavated, in work under this contract, such gravel surfacing shall be replaced over the disturbed area to the original depth and grade and of material similar and equal to the original material.

Where hot mixed asphalt (HMA) is being placed, a minimum of 8 inches of crushed limestone aggregate base, meeting the requirements of MDOT dense graded aggregate 21AA, shall be placed and compacted to 98% of its maximum unit weight at optimum moisture content, in preparation for the HMA pavement per plans.

Where concrete curbs or sidewalks or private driveways are disturbed, damaged, or cut through by the Contractor for work under this contract, such curbs and sidewalks or driveways shall be removed and replaced.

Except where plans call for payment of aggregate base by other means, payment for water mains will be made on the basis of excavation and backfill as herein specified and no claims for extras on these items will be allowed.

E. Testing Water Main

After the line is installed, it shall be pressure tested by the Contractor (witnessed by City of Flint Water Distribution personnel) for two (2) hours at 150 psi. Allowable leakage will be calculated by using the formula-

Allowable leakage is:

$0.092 \text{ GPH} * \text{LENGTH OF PIPE (IN FEET)} * \text{NOMINAL DIAMETER (INCHES)} / 1000 \text{ FT}$
@ 150 PSI TEST PRESSURE

Chlorination shall be completed in accordance to AWWA C650, pressure testing shall be accordance with AWWA C600-05 and disinfection shall be per AWWA C651-99. Chlorination and disinfection of new mains laid under this contract will be performed by the City soon after testing and if feasible, in connection with flushing of the main. The chlorinated water shall be drained out of the pipe line by the Contractor and he shall be responsible for repair of any erosion or damage resulting from this operation. If, during the filling, testing or disinfection of any section of main, turbidity appears in the samples or if it becomes impossible to obtain a sterile sample by chlorination, the Contractor shall remove, at his own expense, the source of the turbidity or contamination, by flushing and/or draining, entering, digging up, and cleaning, to the end that it may be possible to obtain a clear sterile water from the main.

Bacteriological testing shall include two (2) consecutive safe bacteriological samples, obtained at least 24 hours apart for each run of pipe, not to exceed 1,200 feet.

F. Valves

1. Installation

Gate valves up to and including 12" shall be placed in a vertical position and all sizes above 12" shall be placed horizontally in the line. Care shall be taken that the spindle of a vertical valve is vertical and that horizontal valves have the shaft of the driving pinion in a vertical position.

All valves shall have valve boxes unless otherwise specified on the plans or by the engineer in the field.

Check valves in well structures shall be installed per manufacturers specifications, per plan details and as directed by the Engineer.

Tapping valves and sleeves shall be installed by approved installers per manufacturers specifications and as directed by the Engineer.

In line stops shall be installed by approved installers per manufacturers specifications and as directed by the Engineer. The work of In Line Stop of the valve size specified shall consist of installation and removal of in-line valve apparatus, capable of stopping flow in a water main under pressure, of the size specified commensurate to the diameter of the water main to which flow is to be stopped, at

locations directed by the Engineer, and includes all work for excavation, concrete pad construction, In Line Stop installation and removal, and backfilling with select fill CIP, meeting the requirements of Granular Material Class II compacted to not less than 95% of its maximum unit weight in 12 inch maximum lifts. This work shall include excavation of an 8' x 8' minimum hole as preparation for the In Line Stop. Traffic control and pavement removal and replacement is not included and shall be paid for separately. Providing materials, labor, and equipment for concrete for each In Line Stop, a minimum of 2' in depth and 6' by 6' in horizontal dimension, is included in this work. The concrete shall have a minimum strength of 2000 psi prior to placement of any In Line Stop apparatus.

2. Valve Manholes (*Gatewells*)

Gatewells (gate valve in manhole) and well structures (check valve in manhole) shall be built in accordance with the details and at the locations shown on the plans and in accordance with the applicable portions of Section 403 of the MDOT Standard Specification, and as specified in this Special Provision.

Manhole bottoms shall be of "Class A" concrete floated smooth. Sidewalls shall be of brick or manhole blocks. Brick or block shall be laid with the long dimension radially in the manhole. Every brick or block shall have full mortar joints on the bottom and sides, which shall be formed at one operation by placing sufficient mortar on the bed and forcing the brick or block into it. Horizontal joints shall not exceed 3/4" except for exterior joints in the domed portion of the manhole and the vertical joints on the inside of the manhole are built up. Brick or block manholes shall be plastered on the outside with a 2" coat of mortar. Mortar used for masonry work shall only be mixed in quantities which are immediately useable. Any mortar which is set sufficiently to require retempering shall not be used. When the manhole is completed, cast iron ring and cover are to be set in place to line and grade.

If the Contractor is approved to use precast manholes, the *Gatewell* shall be in accordance with Section 403 of the MDOT Standard Specifications, and as shown on the plans. Where contractor is approved to use precast manhole components, it shall be the contractor's responsibility to order manhole components with proper pipe hole location and orientation and contractor accepts all costs for re-ordering new components and disposition of unacceptable components.

G. Fire Hydrants

1. Scope

Under this item, the Contractor shall install fire hydrants as shown on the plans and specified herein.

2. Installation

Fire hydrants shall be installed with the barrel vertical and with base of hydrant head substantially at final grade. At the base of the barrel, of each hydrant, shall be placed not less than one cubic yard of coarse gravel to provide drainage and thrust

blocks will be required if mechanical joint pipe and hydrant is used. Backfill shall be thoroughly tamped around hydrant barrel for its entire depth below ground.

H. Concrete Thrust Block, Encasement & Anchoring Fittings

1. Scope

Under this item the Contractor shall furnish all labor, materials, tools and equipment for all concrete thrust blocks at angles in the main or as otherwise shown on the plans, all concrete encasement of water main required and for all retainer glands or anchoring fittings specified plans. Retainer glands are not to be used on cast iron pipe.

2. Materials

Concrete materials, reinforcing steel and concrete shall conform to the plans and as specified herein. All concrete used under this item shall be "Class A" concrete.

3. Thrust Blocks

At all tees, bends and ends of main, or as otherwise shown on the plans, a "Class A" concrete thrust block shall be placed between the side or end of the pipe or fitting and DDE extending to the undisturbed side or end of the trench as the case may be to take up thrust in the line. Thrust blocks shall be City standard as shown on plan sheets or approved equal.

When special conditions are encountered in which concrete thrust blocks do not give adequate protection to the installation, in the opinion of the Water Distribution Supervisor, steel tie rods shall be installed. No claims for extras will be allowed when tie rods are specified. Concrete thrust blocks will be installed in all cases in addition to the tie rods where specified.

4. Anchoring Fittings

Where specified on the plans, anchoring fittings shall be used in lieu of concrete thrust blocks.

I. Maintenance of Trenches

1. Scope

It is the intention of these specifications that street right-of-way surfaces shall be replaced and left in the same (or better) condition as before excavation was made. Where excavation has been made in an established lawn area, the contractor will be required to grade, reseed with a perennial grass seed, and cover with straw, after a reasonable time has been allowed for settlement and maintenance of the trench. All proposed upgrades to the roadway are outlined on the plans.

J. Service Lines

1. Scope

Service leads to existing and buildings shall be Type K Copper. The sand backfill (when under the influence of the roadway) will be compacted to 95% of the Maximum density. The contractor is to provide all Type K Copper, curb stop, and box. Contractor is to provide all corporations (installed by City of Flint). City of Flint personnel will make all connections to existing service lines. Exact locations of services shall be located in the field as supervised by the Water Distribution Supervisor. Service lines shall be perpendicular to buildings and main having no curves between building and main.

Trenchless installation of water services using push bores, directional drilled, and other approved methods shall use standard, approved construction methods. The Contractor shall submit a boring plan detailing equipment, materials and procedure to be used prior to beginning work. The Contractor shall be responsible for locating any existing utilities in the bore route for the new service lead ensuring no damage to existing utilities. Contractor will be responsible for approved repair to any damaged utility facilities at no additional cost to the contract.

K. Filling abandoned Structures and Main with Flowable Fill

1. Scope

The abandoned structures, vaults, and water main shall be *completely* filled with flowable fill (lean cementitious grout) unless specified for removal and as directed by the Engineer. This shall take place once the old water main is completely out of service. The Contractor shall utilize enough points to inject the flowable fill into the abandoned water main to *completely* fill it for the entire length of the project, or as directed by the Engineer. Furnishing, installing and, if necessary, removal of all fittings, standpipes, caps and work necessary to completely fill abandoned structures and main are included in payment for Flowable Fill.

Measurement And Payment

The work of constructing water main will be paid for at the contract unit price for the actual quantity of each of the following pay items actually constructed.

<u>Pay Item</u>	<u>Pay Unit</u>
Rem Gate Well	Each
Rem and Salvage Hydrant Assembly	Each
Water Main, Rem, Modified	Foot
____" DI Water Main, Tr Det G	Foot
Connection to Existing Water Main	Each
Fire Hydrant w/ Valve Assembly	Each
Gate Valve and Box, ____ inch	Each
Copper Water Service, Open Cut, ____ inch	Foot

ROWE: COF

17 OF 18

MARCH 2011

Curb Stop and Box	Each
Pressure Testing	Lump Sum
Contractor Cost for Water Main Inspection	Dir
Miscellaneous Water Main Coordination Allowance	Lump Sum

Installation of corporations and connections to the existing services (materials provided by Contractor) will be by City of Flint personnel. This work will include all labor by City of Flint personnel to install corporations to the existing and proposed water main. All material and equipment necessary to excavate and restore the area will be the responsibility of the Contractor and included in the Miscellaneous Water Main Coordination Allowance pay item.

Dewatering operations(trench and/or pipe) associated with Alterations to the Municipal Water System will not be paid for separately, but will be included in the contract unit prices bid for the effected pay items.

The cost of excavation, disposal of excess material, and furnishing, placing, and compacting the backfill, including 8-inch minimum 21AA crushed limestone subbase in pavement areas, will be considered as included in the contract unit prices bid for the effected pay items.

___" DI Water Main, Tr Det G of the sizes specified, will be measured in place per *foot* along the centerline of the pipe, with no deductions for fittings. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the work specified herein and as shown on the plans, including inspection/water main connection fees paid to the City of Flint Water Service Center, furnishing and installing all appurtenances, tees, temporary and permanent plugs, oversize solid mechanical joint sleeves, fittings, reducers, gaskets, polyethylene encasement, knocking down existing water boxes, thrust blocks, bracing or sheeting, and all other miscellaneous items necessary for the installation of pipe and reconnection to the Municipal Water System as described in the plans. Payment for all material, labor and equipment necessary to remedy an unsatisfactory hydrostatic test, including removing and replacing any backfill, shall be considered as included in the contract unit price for ___" DI Water Main, Tr Det G.

Connection to Existing Water Main regardless of size, will be measured in place per *each* with no deduction for fittings and sleeves or work and materials to cup and cap existing mains with approved methods and materials. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the work specified herein and as shown on the plans, except connections to the existing water main (materials provided by Contractor) will be provided by City of Flint personnel. This work will include all fees and labor by City of Flint personnel to make a connection to the existing water main. All material and equipment necessary to excavate and restore the area will be the responsibility of the Contractor and included in other pay items.

Copper Water Service, Open Cut, ___inch of the sizes specified will be measured in place per *foot* along the center of the trenched in Type K copper tubing. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the work specified herein and as shown on the plans. The sand backfill(when under the influence of the roadway) will be compacted to 95% of the Maximum density. When in pavement areas, 21AA crushed limestone subbase, 8 inch minimum depth, will be compacted to 98% of the Maximum density. The cost for excavating for the curb box, placing curb box & curb stop, furnishing corporations and coordination/connection fees with City of Flint forces on placing corporations and connection to existing leads will be included in

the pay item for Curb Stop and Box. Locations of services shall be supervised in the field by the Water Distribution Supervisor. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the work.

Gate Valve and Box, ____ inch of the type and size specified, will be paid for at the contract unit price *Each*, which price shall be payment in full for furnishing and installing the valve box complete and ready for use. Contractor shall remove, salvage and stockpile at an approved on-site location all existing valve boxes which will be considered incidental to the items of the contract and shall not be paid for separately.

Fire Hydrant w/ Valve Assembly will be paid for at the contract unit price, *Each*, which price shall be payment in full for furnishing and installing the hydrant and valve assembly, including connection to the pipe from the main regardless of length, complete and ready for use at the locations shown on the plans. Contractor shall remove, salvage and deliver to the City all existing hydrants paid for as Rem and Salvage Hydrant Assembly.

Pressure Testing will be paid for as a *Lump Sum*. The price shall include payment in full for furnishing all material, labor, and equipment required to perform the pressure test procedure and set up the water main for chlorination (equipment by Contractor). City of Flint Water personnel will perform the Chlorination of the water main. Additional time and labor required (call back time) for re-chlorination or additional testing oversight due to non-passing tests will be billed to the Contractor, at a rate of \$250 per hour.

Any required auxiliary valves, or any other item for which separate items have been set up will be paid for separately.

Contractor Cost for Water Main Inspection will be paid for as by the *Dollar*. The price shall include payment in full for City of Flint personnel to inspect water main installation. Labor required for water main inspection be billed to the Contractor, at a rate of \$210 per hour. Additional inspection time required due to contractor laxity will be billed to the Contractor at the rate stated above and will not be compensated as a part of this project.

Water Main, Rem, Modified will be paid for at the contract unit price per *Foot* of water main of any size or material type removed and disposed of off site. Removed material shall become the property of the Contractor to be properly disposed of. Payment includes all labor, equipment and disposal costs to complete this item of work.

Rem Gate Well will be paid for at the contract unit price per *Each* gate well of any size or material type removed and disposed of off site. Removed material shall become the property of the Contractor to be properly disposed of. Payment includes all labor, equipment and disposal costs to complete this item of work.

Cutting and capping the existing water main as necessary will be included in the Water Main, Rem, Modified pay item and will not be paid for separately. This work will included cutting and capping water main of any size or material by approved methods and shall include saw cutting, fitting connection and cap fitting or plug of approved type.

**CITY OF FLINT
WATER TREATMENT PLANT
SANITARY SURVEY
JANUARY 2013**



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

April 9, 2013

Mr. Daugherty Johnson, Utilities Administrator
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502

WSSN: 02310

Dear Mr. Johnson,

SUBJECT: City of Flint, Water Treatment Plant Sanitary Survey

This letter confirms my visits with Mr. Brent Wright, water treatment plant (WTP) superintendent, on December 13, 2012, and January 16, 2013, and summarizes the subsequent review and discussion of the water supply facilities serving the city of Flint. The purpose of this meeting 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). In addition, the enclosed Water System Sanitary Survey was updated to gather information on the Flint WTP.

Our updated survey visit confirms that intermediate chlorination was installed at the primary clarifier outlet in 2010 and is being used in WTP test runs. Also, a more permanent de-chlorination feed system was installed in the Pump Station #4 building to de-chlorinate filter to waste water prior to discharge to the Flint River during routine test runs. These provisions increase confidence in the WTP's ability to produce water that meets the drinking water standards. Subsequent WTP test run report continue to show that the WTP can operate as an effective stand-by treatment facility.

The following table summarizes our findings from our survey of the water system:

Survey Element	Findings
Source (Including P.S. 4)	Deficiencies Identified
Treatment	Recommendations made
Distribution System	Not evaluated – see dist. survey
Finished Water Storage	Recommendations made
Pumps (All dist. Pumping)	Not evaluated – see dist. survey
Monitoring & Reporting	No deficiencies/recommendations
Management & Operations	Recommendations made
Operator Compliance	Recommendations made
Security	No deficiencies/recommendations
Financial	Not Evaluated – see dist survey
Other	No deficiencies/recommendations

Mr. Daugherty Johnson

3

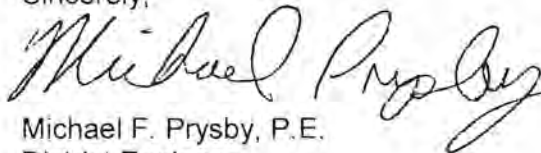
April 9, 2013

- H. Provide an adequate seal on the door sweep for the chlorine gas room interior door. This provision will reduce the possibility of an accidental chlorine gas leak spreading to the remainder of P.S. #4.
- I. Inspect the 3.0 million gallon clearwell and verify the integrity of the concrete base around each of the manhole vent. Please provide us with a copy of the inspection report.
- J. The WTP is equipped with numerous valves that are essential for operation and isolation critical components of the WTP. We recommend that WTP operators continue to maintain and expand their program of operating critical WTP valves. Maintaining an active valve program will help to keep WTP valves in good operating condition; thus maintaining the operating reliability of the WTP.
- K. Prepare an accurate WTP yard piping diagram. The yard piping diagram should denote the location of buried piping on WTP grounds and their points of connection to the WTP, reservoirs, control stations, and the elevated tank.
- L. Designate a back-up operator for the WTP. The back-up operator must have a complete treatment (F-4 or higher) certification.

Please submit a letter by *May 30, 2013*, that outlines the city of Flint's plans and schedule to address the above items.

If you have any questions, feel free to contact me at (517) 335-6122; prysbym@michigan.gov; or Department of Environmental Quality, Office of Drinking Water and Municipal Assistance, Lansing District Office, 525 West Allegan Street, 4th Floor North, P.O. Box 30242, Lansing, Michigan 48909-7742.

Sincerely,



Michael F. Prysby, P.E.
District Engineer
Field Operations Section
Office of Drinking Water and
Municipal Assistance

mfp/jlr
Enclosure

cc: Mr. Howard Kroft, Utilities Director, City of Flint
Mr. Brent Wright, WTP Superintendent, City of Flint
Mr. Edward Kurtz, Emergency Manager, City of Flint
Ms. Inez Brown, Clerk, City of Flint

DEQ Office Address 1
DEQ Office Address 2
Phone:
Fax:

WSSN: 2310

Office of Drinking Water and Municipal Assistance
Lansing District Office

Water System Sanitary Survey
Flint Water Treatment Plant
Jan-13



Sanitary Survey of Community Water Supply - Review Summary

Water Supply: City of Flint - WTP

County: Genesee

Evaluator: Michael Prysby, P.E.

WSSN: 02310

District: 11

Date: 1/16/2013

Category	Comment	N/A	NotEv	NoD/R	Rec	Def	SigDef
Source - including Pump Sta. 4						X	
Construction & Maintenance	op. L.S. pumps #3 & #4 periodically additional st-by power needed				X		
Standby Power						X	
Isolation		X					
Source Water Protection				X			
Capacity	Dtm. future use level for firm cap.				X		
Treatment					X		
Disinfection	CL gas rm. door sweep seal needed				X		
Fluoride				X			
Phosphate Addition		X					
Softening	Attempt softening to gain proficiency				X		
Iron/Manganese Removal		X					
Arsenic Removal		X					
Pretreatment	Control moisture in flocc. control rm.				X		
Filtration (gravity or membranes)	Elim. bottleneck in w. wash water line				X		
C*T	Add O3 sample tap in diff. ch. Cell 1				X		
Other				X			
Distribution System (see dist. Survey)			X				
Interconnections w/ Other WS			X				
Hydrants & Valves			X				
Service Lines & Metering			X				
General Plan			X				
Cross Connections			X				
Construction & Maintenance			X				
Capacity			X				
Finished Water Storage					X		
Construction & Maintenance	Inspect 3 MGAL Well				X		
Controls					X		
Capacity				X			
Pumps (All Distribution System Pumping Fac.)			X				
Construction & Maintenance			X				
Controls			X				
Capacity			X				
Monitoring & Reporting				X			
Bacteriological Monitoring				X			
Chemical Monitoring				X			
MOR or Annual Pumpage Report				X			
Consumer Confidence Report				X			
Analytical Capabilities				X			
System Management & Operations					X		
Owner Responsibility				X			
Capacity Development				X			
Reliability Study			X				
Operations Oversight	Expand valve program, yard piping dia				X		
Permits				X			
Operator Compliance					X		
Operator Certification	Designate back-up operator				X		
Technical Knowledge & Training				X			
Security							
Emergency Response Plan				X			
Site Security (Fences, Alarms...)				X			
Financial							
Rates			X				
Budget & Capital Imp. Plan			X				
Other	Provide respirators for CL gas leak				X		

N/A - Not Applicable

Rec - Recommendations Made

NotEv - Not Evaluated

Def - Deficiencies Identified

NoD/R - No Deficiencies/Recommendations Made

SigDef - Significant Deficiencies Identified

FLINT WATER TREATMENT PLANT
SANITARY SURVEY
EVALUATION FORM

BASIC DATA

Name of Supply: City of Flint

Review Dates: 12/13/2012
01/16/2013

WSSN: 2310

Reviewed By: MFP

Mailing Address: 1101 South Saginaw Street
Flint, Michigan 48502

Plant Address 4500 North Dort Highway
Flint, Michigan 48505

City Officials

Mayor: Dan Walling

City Administrator: Mike Brown - EFM

Utilities Director: Howard Kroft

Water Plant Superintendent: Brent Wright - Provisional Supt.

Operator-In-Charge (OIC): Mike Glaskow - F-1

Designated Backup Operator: Not designated

MDEQ Conclusions/Recommendations:

WTP operators continue to pursue adequate operator certification. The ongoing WTP test runs provide WTP operators the opportunity to gain experience in all F categories in accordance with the certification requirements set forth specifically for the Flint WTP. It is important for all operators to continue to maintain their record of all hours worked during WTP test runs since their eligibility to write any higher level F exam is based upon their experience accrued during actual WTP test run operation. Finally, the WTP has designated their OIC; however, a back-up operator has not been designated. A back-up operator holding a complete treatment certification needs to be designated for the Flint WTP.

Water Treatment Plant (WTP) Operators:

Brent Wright	F-2, S-3	Matt McFarland	F-3, S-3
Chris Koryciak	F-4	Tom Childs (Operation)	F-4
Robert Duby	F-4, S-4	Mike Glaskow (Lab)	F-1, S-3
Charles Yanta	F-3	Nicole Alexander (Lab)	F-3, S-4
Rodney Jackson	F-3, S-3	Mike Beckley (Maint)	F-4, S-4
Tim Bratton	F-4	Donald Echlin	F-4
Scott Dungee	F-4, S-4		

Distribution System Superintendent: Robert Bincsik - S-1

Organizational Chart: See Appendix A

Wholesale Customers:

Population

Genesee County Drain Commissioner:

153,000 - combined GCDC wholesale and retail

City of Flint:

102,434 2010 Census

Total Population Served:

255,434

Percent Metered: 100%

Percent Unaccounted: 68% (from 2011 reliability study)

Water System Construction Features & Dates:

The Flint WTP is a 36 MGD water treatment facility that has recently undergone a \$45 million rehabilitation project. The project allows the facility to serve as an emergency stand-by treatment plant. The WTP is not operated on a routine basis however, the facility can be placed into operation in the event that the single 72-inch transmission main (pipeline) serving Flint from the Detroit Water & Sewerage Department (DWSD) were to fail.

The city of Flint purchases bulk water from the DWSD and distributes it to the city. Portions of the treatment plant including Control Station No. 2, Dort Reservoir, and Pump Station No. 4 play a vital role in daily operation and transmittal of purchased water from DWSD to much of Flint's service area. Below is a summary of the most recent construction features at the Flint WTP. Copies of the construction permits for Segments 1-4 can be referenced in **Appendix B**.

1. Segment 1 WTP Rehab - Construction of new rapid mix and flocculation basins, interconnect structure, SCADA control, and boiler facility. 1999 - 2000
2. Segment 2 WTP Rehab - Construction of new primary clarifier structure 2000 - 2001
3. Segment 3 WTP Rehab - Construction of west solids contact unit for lime softening, 2 new lime slakers, four rapid gravity sand filters, new chemical feed room, two new intake traveling screens 2001 - 2002
4. Segment 4 WTP Rehab - construction of east solids contact unit for lime softening, 2 additional lime slakers, eight rapid sand gravity filters, and one ozone treatment facility. 2003 - 2005
5. Intermediate chlorination installed at primary clarifier outlet (used in Nov. 2010 WTP test run).
6. Temporary de-chlor system (drip system) installed in 2009. Used in 2009 pipeline emergency.
The de-chlor system now uses calibrated LMI feed pumps and is located in the NW corner of Pump Station No. 4.

Is Vulnerability Assessment Available for review? Yes, available at the WTP

Is Emergency Response Plan Available for review? Yes, available at the WTP

Plant Personnel/Construction/Security comments:

Security provisions include: perimeter fencing, a guard building at the main entrance, surveillance cameras at the front desk and guard building, and intrusion alarms within the ozone building. The WTP is staffed during normal working hours, all building entrances are unlocked, and the main gate is open. After 4pm, staffing is limited to operations personnel, all entrances are locked, and the main entrance gate is closed.

City of Flint Pumpage Data (Million Gallons Per Day)

Year	MDD	ADD	AD - Max mo	min. day	G/C/D
2001	26.03	18.13			145
2002	26.44	18.45	21.8	15.65	148
2003	30.05	19.9	25.22	16.59	159
2004	23.06	16.86	19.89	15.33	135
2005	23.79	17.64		11.56	141
2006	24.55	16.19		13.28	130
2007	26.38	17.02		12.53	159
2008	18.66	15.23		10.06	145
2009	21.57	14.03		9.28	136
2010	17.5	14.09		10.95	138
2011	20.41	13.92		9.01	136

WATER TREATMENT PLANT

See **Appendix C** for a WTP flow diagram

Plant Design Capacity: 36 MGD

State Rated Capacity: To be determined

<u>Metering</u>	<u>Y/N</u>	<u>Type/Location</u>
Raw Water:	Yes	Ultrasonic flowmeter after risewell in piping below lime feed rm.
Finished Water:	Yes	Venturi meter at the end of the filter confl. piping in filter gallery.
Backwash Water:	Yes	Pressure differential meter (similar to an ultrasonic meter) on main washwater line with readouts on each filter console and totalizer on SCADA.
Plant Water:	Y&N	Plant domestic water is not metered. Process water is metered at each process point.

Total Treated Water Storage 3.0 MG

Treatment Plant

Clearwell: None

Ground Storage: 3.0 MGAL Well - prior to P. S. 4 (also functions as clearwell & dist. storage)

Distribution System

Elevated Storage: 2.0 MGAL at WTP

Dort Reservoir: 20 MGAL ground storage at WTP

Cedar St. Res: 20 MGAL ground storage within distribution system

Westside Res: 12 MGAL ground storage within distribution system

Total (MG) 57.0 MGAL

Percent of Maximum Day: 190%

Emergency Supply/Interconnection:

Donaldson Road meter pit: westside of city via 12-inch connection

Orgould Station: station taken out of service however piping remains connected

Others: Several other locations however, the interconnects are locked out.

Demand/Capacity/Storage Comments:

Flint purchases water from Detroit through a 120-inch transmission main from the Detroit Lake Huron WTP west to the Imlay Pump Station. From Imlay west, water is transmitted through the 72-inch pipeline. Water reaches the Flint WTP beginning at Control Station (CS) #2. C.S. 2 monitors incoming pressure, flow rate, turbidity, and chlorine residual. The control station is equipped with a 60-inch and 36-inch flow control valve. Flow to PS #4 via the 3 MG well is directed through the 36-inch valve. The 60-inch valve is normally kept closed. Adequate turn-over of water in the Dort reservoir is accomplished by throttling the 36-inch valve at C.S. 2 thus augmenting some of the flow around C.S. 2 and through the Dort reservoir.

The Dort reservoir can be filled only from the 72-inch pipeline. WTP would like to gain the ability to pump directly from the WTP to Dort then thru to P.S. 4 which would require a finished water pump station.

There were two pipeline emergencies in 2009 that resulted in WTP treating Flint River water and distributing it to the city. The first emergency involved repair of a break along a compound curve in Genesee Road. The line was taken down and welded. The WTP supplied the city water for approximately 2 days. A boil water advisory was issued as a precaution since plant tap bacteriological samples could not be collected while the WTP was filtering to waste to the Flint River (prior to switch-over). The second emergency involved repair at the same location; however, a new section of pipe was installed instead of welding. The WTP distributed water to the city for approximately 3 days during this repair. A temporary intermediate chlorination system and a de-chlor (drip-feed system) were set-up which allowed chlorinated water to pass thru the filters for plant tap monitoring and confirmation of acceptable bacteriological samples. These measures allowed the WTP to supply the city without having to issue a boil water advisory. Finally, the pipeline was taken out of service in 2012 to evaluate a potential repair and the WTP was placed into emergency operation. The city did not proceed with the repair at that time and the WTP did not distribute treated water.

WTP staff continue to conduct quarterly plant test runs. 4 test runs were conducted in 2009, followed by 3 in 2010, 3 in 2011, and 4 in 2012. Table 1 on the following page shows a summary of WQ data obtained during the WTP test runs since 2010.

TABLE 1 Test-Run: Water Quality

	Raw		Treated	
	Normal	Range	Normal	Range
Hardness, ppm	266	214 - 316	257	220 - 296
Turbidity, NTU	13	3.00 - 150	0.13	.07- 0.47
Color				
Alkalinity, ppm	210	146 - 257	155	41 - 208
Total Col, cts/100 ml	*	*	*	*
TOC, ppm				
Nitrate, ppm				
Fluoride, ppm	0.18	0.15 - 0.22	0.19	0.13 - 0.21
TTHM, ppb				
HAA5, ppb				
pH	8.1	7.26 - 8.45	7.34	7.09-7.52

Monitoring Requirements: See Monitoring Schedule, **Appendix D**

Complete Chemical Analysis: See **Appendix E**

* See WTP Test-Run reports in **Appendix F**.

Comments:

The WTP filters are equipped with on-line continuous monitoring turbidimeters on each filter effluent line; however, plumbing changes were necessary since the WTP operates in filter to waste mode the majority of the time. Individual filter turbidities are obtained once every 4hrs with grab samples during each of the WTP test-runs. The WTP also has a combined filter effluent (CFE) turbidimeter, however, CFE monitoring cannot be conducted when the WTP operates in the filter to waste mode since the location of the turbidimeter is downstream of the filtered water discharge point.

Intake Facility

Name of Source: Flint River
Source Capacity: 23 CFS (lowest 7-day mean flow 1933-1999)
Diameter of raw water intake pipe: 72-inch
Total Length: 50 Ft
Intake/crib capacity: 36 MGD
Location (latitude/longitude): 43° 03.293 min N 83° 40.126 min W
Submergence: 4 Ft at 709 USGS (708 Ft - 710 Ft is typical range of river level elevation)
Entrance Velocity: 2.0 Ft/Sec at 36 MGD
Grating: 2 1/2 inch x 1/2 inch at 1 1/2 inch on center bar racks
Zebra Mussel Control: None
Historic Low Water Elevation: NA - never less than 708 Ft USGS
Historic Low Water Flow: NA - never less than 708 Ft USGS
Historic High Water Elevation: 717 Ft USGS
Standby (Emergency) Intake? None
Source Water Assess. Plan avail.? Yes
Back flush provisions? No

Comments:

Water flows through the intake by gravity to the traveling screens. The old traveling screens were replaced with two new US Filter traveling screens during the first segment of the WTP rehabilitation project. The screens are cleaned during each WTP test-run. A pull-up door is opened and a collection trough is exposed. WTP staff spray debris out of the trough using plant service water. The debris are bagged and sent to the local landfill for disposal.

MDEQ Conclusions/Recommendations:

The city has addressed the concern of adequate submergence at maximum drawdown of the Hamilton Dam. The water level and available pool depth were investigated in early 2009 and it was determined that sufficient pool depth is available at the maximum drawdown mandated by the Dam Safety Unit (705.25 ft water elevation) to maintain rated capacity of the low-service pumps; however, pump cavitation occurred when the water elevation was lowered an additional 6-inches.

Pumps and Pump Locations

<u>Purpose</u>	<u>Location</u>	<u>HP</u>	<u>Capacity</u>	<u>Type</u>	<u>Lubricant</u>	<u>Status</u>	<u>PM</u>
Low Service:							
#3	P.S. 4	250	30 MGD	HC	Yes	Op.	See comments
#4	P.S. 4	200	25 MGD	HC	Yes	Op.	See comments
#5	P.S. 4	150	20 MGD	HC -VFD	Yes	Op.	See comments
#6	P.S. 4	125	15 MGD	HC - VFD	Yes	Op.	See comments
Total Capacity			90 MGD				
Firm Capacity			60 MGD				
High Service:							
#1	P.S. 4	800	20 MGD	HC	Yes	Inoperable	
#2	P.S. 4	1000	25 MGD	HC	Yes	Not used	
#7	P.S. 4	800	20 MGD	HC	Yes	Operable	
#8	P.S. 4	800	20 MGD	HC	Yes	Operable	
#9	P.S. 4		6 MGD	HC	Yes	Operable	
Total Capacity			46 MGD - See MDEQ Conclusions/Rec				
Firm			26 MGD - See MDEQ Conclusions/Rec				
Ferric Sludge:							
#1	WTP base	9	350 GPM	HC	Yes	Operable	Yes
#2	WTP base	9	350 GPM	HC	Yes	Operable	Yes
Lime Sludge:							
#1	WTP base	15	230 GPM	PC	Yes	Operable	Yes
#2	WTP base	15	230 GPM	PC	Yes	Not used	Yes
Filter Backwash: None							
Reclaim: Yes, see Ozone section for further discussion							
Sludge Disposal: Yes							

Comments:

Low Service: A Low Tox Turbine oil is used to maintain each pump motor. The upper portion of the pump motor also requires grease. Pump operation is maintained by WTP staff once every two hours while in operation and routine maintenance is performed once a month. Pump suction is isolated by gate valves and pump discharge is isolated by butterfly valves and all of the valves have been exercised. All four pumps are operational however, Pumps #3 and #4 are not a good match for test run treatment rates. These pumps are used during treatment start-up (filling basins, etc.). Newer Allen Bradley switchgear (VFD controlled) is in place for Pumps #5 and #6 and these pumps are used during the plant test runs. Pumps #3 and #4 are controlled by original Westinghouse switchgear. The pump motors and switchgear are located on the main floor of Pump Station #4 and are not subject to flooding. The horizontal centrifugal pumps are located in the pump station sub-basement and are subject to flooding.

High Service: Low Tox Turbine oil is used to maintain the pump motor for pumps #1 and #2. Pumps 7, 8, and 9 are maintained with an Elmac 1263 high temperature grease. H.S. Pump #1 is burned out and cannot be operated. H.S. Pump #2's operating condition is unknown and this pump would be used only in an emergency situation. H.S. Pump #7 and #8 are in good operating condition and are throttled during emergency operation. H.S. Pump #9 has a lower capacity and the pump's main purpose is to recirculate water in the 3 MGAL Well. WTP staff are discussing with the city the possibility of replacing H.S. Pumps #1 and #2 with lower capacity VFD controlled pumps.

Sludge Pumps: These pumps are in good condition and are maintained on a regular basis. Both lime sludge pumps are in operating condition however, new pump controls are needed for Pump #2.

MDEQ Conclusions/Recommendations

LS Pumps #3 and #4 should be operated periodically between WTP test runs to ensure that the pumps and switchgear remain in operating condition. Eventually, it may be worthwhile to replace the switchgear in order to increase the flexibility of operation of the low service pump station.

Since H.S. Pump #1 is not operable and H.S. Pump #2 is for emergency use only, the total and firm pumping capacity of high service is limited to 46 MGD and 26 MGD respectively. The DEQ is comfortable with the total and firm capacity to meet Flint's water usage in the event of an emergency repair on the pipeline; however, the firm high service pumping capacity falls somewhat short in meeting the combined needs of Flint and Genesee County during an extended pipeline emergency.

The combined needs of Flint and Genesee County will soon be identified as the scope of the Karegnondi Water Authority (KWA) is finalized and Flint's long-term source of water is determined. These factors will determine the future use level of the high service pump station. When the outcome of Flint's long-term source of water and the KWA project are determined, the future use level of the pump station will need to be evaluated to determine the amount of high service pumping capacity and other station improvements that may be needed.

Electrical power for the WTP (low and high service pumping) is provided by a dual 46-KV primary electrical feed with automatic transfer, however the dual feed originates from the same switch yard. Although the WTP has two main substation transformers, the configuration will not address power issues that could occur with the generating utility or transmission grid. Additional provisions for stand-by power including on-site generation will need to be provided if the WTP becomes a full-time operating facility.

Treatment Facilities

Ozone Facility

Location: Immediately east of the main treatment plant - WTP II

Contact Basins: 3

Capacity: 12 MGD per contact basin

Generators: 2

O3 Concentration: 6%

O3 rate: 1300 Pounds/day per generator

Storage:

9000 gallon liquid oxygen 10 ft diameter double walled horizontal tank rated at 75 psi
 N₂: 540 gallon 5.5 ft diameter double walled vertical tank rated at 250 psi
 O₂ Vaporizer: 2 @ 12,000 scfh
 Heaters: 2 @ 12,000 scfh to maintain minimum O₂ temperatures

Diffusion System:

42 dome ceramic bonded fused alumina, fine bubble diffusers in each contactor basin (3 basins total or 126 diffusers)

Ozone Destruct System:

Sodium bi-sulfite feed system utilizing 3 LMI feed pumps each rated at 4.00 GPH @ 100 psi
 An additional spare pump is provided for a total of 4 LMI pumps - C921-460S1.

Sodium bisulfite is stored as a 38% solution in 55-gallon barrels from PVS Knollwood. The compound is gravity fed to a calibration chamber prior to the metering pumps.

2 off-gas thermal-catalytic destruction units with a design capacity to reduce the O₃ concentration of the off-gas flow to less than 0.05 ppm. Each blower is rated at 306 scfm.

The ozone facility consists of 3 concrete contactor basins with each basin composed of one diffusion chamber divided into 2 cells by means of overflow and underflow baffle walls. Raw water is fed into the ozone building's pre-sedimentation chamber through a 48-inch main from the low service pumps. Three 36-inch influent piping to each contactor basin from the pre-sedimentation basin are provided. Ozone is fed into the first cell through the diffusion system located at the floor in a counter-current fashion. Ozone is fed into the second cell through a second diffusion system in a co-current fashion. The maximum flow is 1.5 scfm per diffuser. Each contact basin is metered (both rate of flow and totalizer).

Each of the three contact basins contain six contact chambers following the diffusion chamber. The size and contact times at 12 MGD for each portion of the contactor basin (diffusion cells and contact chambers) are summarized below for CT calculation purposes:

Diffusion Chamber Cell 1 -	805 Cu. Ft., 0.72 minutes
Diffusion Chamber Cell 2 -	805 Cu. Ft., 0.72 minutes
Contact Chamber, Compartment 1 -	1964 Cu. Ft., 1.76 minutes
Contact Chamber, Compartment 2 -	3592 Cu. Ft., 3.22 minutes
Contact Chamber, Compartment 3 -	3592 Cu. Ft., 3.22 minutes
Contact Chamber, Compartment 4 -	3692 Cu. Ft., 3.22 minutes
Contact Chamber, Compartment 5 -	3692 Cu. Ft., 3.22 minutes
Contact Chamber, Compartment 6 -	2760 Cu. Ft., 2.48 minutes

Total volume of contactor basin: 20,702 Cu. Ft.
 Hydraulic Retention time: 18.56 min @ 12 MGD
 Baffle factor: 0.7

T₁₀: 12.97 minutes

Initial O₃ concentration: 0.7 ppm Final O₃ concentration prior to destruct: 0.0 ppm

Reference contactor basin diagram - Appendix G

Each contactor basin is provided with 3 sampling points for monitoring of residual ozone for CT determination. The sampling points are located at the end of diffusion chamber, end of contact chamber 3, and the end of contact chamber 6.

The capability to reclaim filter backwash water is provided at the pre-sedimentation basin in the ozone building. Three backwash water reclaim pumps are located on the bottom floor of the ozone building adjacent to the pre-sedimentation basin. 12-inch piping from the backwash storage retention basin at Treatment Plant 1 is piped to one of three horizontal centrifugal pumps. Each of the 10 hp pumps can pump reclaim water to the pre-sedimentation basin. The backwash water reclaim system is not used during WTP test runs or during emergency production. The backwash reclaim system may be used if the WTP is placed into routine production.

Process water to the ozone building is protected by a Watts 10-inch reduced pressure zone (RPZ) backflow preventer. Domestic water to the ozone building is provided by a 2-inch line just upstream of the RPZ.

Two 3.5ft X 3.5ft access hatches are provided at the top of each contactor basin above the diffusers. Each contactor basin also has one 30-inch diameter flanged hatch located at the bottom of the basin.

Much of the ozone facility's control system has been replaced and/or reprogrammed. Fin-Tek is the new contractor that provides assistance in ozone control issues. The work has resolved most of the start-up issues with the ozone facility.

MDEQ Conclusions/Recommendations:

WTP test runs show that ozone residuals cannot be maintained through the contact chamber; thus, limiting the CT potential. An additional sampling point should be added at the end of the diffusion chamber Cell 1 which will allow for a slight increase in the CT determination. The ozone generators are due for routine cleaning. The generators should also be set on a routine cleaning schedule as per the manufacturer's

RAPID MIX

Number of Units: 2

Volume of each unit: 5.5ft X 5.5ft X 16 ft - 3,620 gallons

Detention Time at rated capacity: Approximately 17 seconds at 18 MGD

Mixer Type: 3.7 HP Lightnin mechanical mixer

Velocity Gradient (G): G-value of 380/sec.

Mixing rate: 4:1 variable speed control

Condition of equipment: Good - new in 2000

Chemicals added: Ferric chloride

Comment on Rapid Mix:

The rapid mix basins are designated as the east basin or west basin and each basin can be isolated with a gate valve. Ferric chloride is fed from the chemical feed room to a calibration chamber and the coagulant is applied directly into the rapid mix basin. Each mixer is maintained during and after each test-run or equipment shake-down. Each motor is lubricated with Low Tox turbine oil.

FLOCCULATION BASINS

Number of Units: 2

Volume of each unit: 44ft X 80.3ft X 16 ft - 422,853 gallons each

Detention time at rated capacity: 34 min

Type of Units: 3-stage flocculation unit

Inlet design: 36-inch piping

Is mechanical flocculator used? Yes, fifteen 1.5 HP Series 10 Lightnin impeller mixers w. variable speed are provided.

Condition of equipment: Good, new in 2000

Is C*T available? Not applicable, no disinfectant residual is carried through the flocculator.

Baffles: Each flocculator is separated into 3 stages with baffle walls in between each stage.

Preventive Maintenance: Monthly maintenance is performed on each of the 15 mixers in each flocculator.

Comments:

Each flocculation basin is divided into 3 stages with 11.3 minutes of detention time per stage at 18 MGD and a flow-through velocity of 1.3 fpm. The main influent is a 36-inch main influent line with five 30-inch outlets. Each stage has five vertical mixers set for a specific mixing speed. The mixers have an AFD 10:1 variable speed control with a G-value ranging from 30/sec to 80/sec. The outlet piping consists of five 36-inch outlets that manifold to a 54-inch pipe prior to entering primary sedimentation. The flocculation basins meet the construction standards established in Section 4.2.3 of Recommended Standards For Water Works.

The flocculation basins and equipment were installed in 2000 and are in good condition. Problems have occurred in the flocculator control room with the digital read-outs failing to function due to the moisture in the air. WTP staff utilize portable hand-held units to monitor and control mixing within the flocculation basins. The original digital equipment has been removed since they are no longer available from the manufacturer.

MOEQ Conclusions/Recommendations:

Although the original equipment cannot be replaced, moisture needs to be minimized in the control room in

Primary Clarifier Structure

Number of Units: Plate settlers - one unit containing three separate plate settler basins.

Type of units: Plate settlers - 50 sqft per plate

Volume of Each Unit: Three basins each at 39.5ft X 82 ft X 17.5 ft - 56,682 cu. ft. each

Plate Settlers: Each basin is equipped with 4 rows of plate settlers - 1216 plates or 60,800 sqft plate area per basin

Detention Time at rated capacity: 51 minutes at 12 MGD - or plate loading rate of 0.14 gpm/sqft

Inlet Design: Two 48 X 48-inch inlet channels

Baffles: Not applicable - no disinfectant residual

Outlet Weir: 4 outlet troughs (8 launders) in each basin 70 ft length or 560 LF of total weir length - 21,400 gpd/Ft

Outlet Design: Four 24 X 24-inch outlet channels,

Baffling Factor: Not applicable - no disinfectant residual

Overflow: 20-inch weir from the effluent channel and a 30-inch outlet that drains to a storm sewer.

Drains: Yes

Curbing: 6-inch curbing

Cleaning Procedure: Spyder sludge collection system consisting of zoned grid of parallel piping under suction

Sludge Disposal: 2 pumps rated at 350 gpm. Sludge is pumped to holding basin for discharge to the sanitary sewer

Physical Condition: good

Effluent turbidity: 0.75 NTUs - based upon the 2009 emergency WTP operation & test-run reports through 2012.

Is C*T available? Not applicable, intermediate disinfection (chlorination) is provided at the plate settler effluent.

Comments:

Outlet piping from the flocculation basins manifolds into one 54-inch pipe. The 54-inch pipe splits into two 48 X 48-inch influents. The first influent pipe is for the existing primary clarifier and the second influent pipe remains for a future clarifier. The rate of flow over the outlet weir slightly exceeds Recommended Standards For Water Works of 20,000 gpd/ft of weir; however the standard is based on straight weir length. The outlet weir at the WTP is a V-notch design with effectively increases the total straight length. Equivalent effective settling has also been demonstrated in WTP test runs at the rated capacity of the basin.

The sludge collection system is designed for automatic operation, however, the float controls are not enabled since they do not function correctly. The sludge collection system is activated manually during each operator shift as part of routine operation.

Intermediate chlorination was added at the plate settler outlet - see Chemical feed section for more detailed discussion.

Softening with Lime Feed - Softening Not Practiced

Number of Units: 2 - East & West

Type of Units: Solids Contact Unit

Volume of Each Unit: 1.28 mgal

Rated Capacity: 17 mgd - West & 19 mgd - East

Upflow Rates: 1.47 gpm/sf - West & 1.64 gpm/sf - East

Detention Time at rated capacity: 118 min - West & 114 min - East

Inlet Design: 36-inch inlet pipe entering central circulation drum

Baffles: NA

Outlet Design: 20 effluent launders - 31.5 ft long - 10.5 gpm/ft weir loading - East unit

Baffling Factor: 0.5 9.4 gpm/ft weir loading - West unit

Overflow: Piping to filters

Drains: Two 6-inch drains, one at bottom of sludge hopper and the other at the bottom of the solids contact unit near the sidewall

Circling:

4-inch kickplates along the walkway and center platform. A 36-inch safety rail is also provided for the walkway, center column, and the outer perimeter of each contact unit. Kick plates are also provided around perimeter of the unit and access is provided to each launder.

Sludge Disposal:

Two sludge rotating scraper arms direct sludge to the center sludge hopper. Sludge from the hopper is directed to the sludge pumps.

Physical Condition: Both solids contact units are new and in good condition.

C*T: See Appendix H

Rapid Mix Area:

Mixing Unit: One marine propeller in central circulation drum with variable speed.

Chemicals added to rapid mix area: Lime and provisions for polymer and soda ash

Velocity Gradient (G) if available? Mixer provided with max. tip speed of 13.2 fpm (VFD controlled in a 6:1 range)

Flocculation Area: Upper zone of central reaction well

Short Circuiting: The unit is designed with baffling and short circuiting has not been noted.

Inlet design: Radial outlet ports from topside of central circulation drum

Is mechanical flocculator used? No

Condition of equipment: New in 2004

Baffles: Yes

Comments:

The solids contact unit has two 4-inch lines to convey lime slurry to the central circulation drum. A 3/4" line conveys polymer to the mixing chamber. The chemical feed lines are fastened to the walkway and connected to the 36-inch inlet pipe. The lime application point is on the 36-inch inlet pipe approximately 15 feet before the central circulation drum. The polymer application point is in the 36-inch inlet pipe approximately 20 feet prior to the central circulation drum. The solids contact unit is constructed in accordance to Recommended Standards for Water Works for softening.

Cleaning Procedure: Each unit is drained to the bottom level through the side drain. The remaining water is pumped out from the unit and the sludge is hosed into the center sludge sump. 6-inch piping connects the sump to the sludge pumps by which the sludge is sent to the Bray Road lagoon. Water from the unit is drained to the sanitary sewer via the 6-inch drain. The southeast lime bin silo experienced problems associated with moisture build-up.

Preventive maintenance: The pump motors and scraper arm gears are greased periodically. The scrapers, skirting, and the condition of other mechanical equipment are also checked.

Effluent turbidity, average/range: 0.6 - 0.7 NTUs. Although softening is not practiced an additional 0.05 - 0.1 NTUs of turbidity settles out in softening clarifier basins.

MDEQ Conclusions/Recommendations:

Both clarifiers were constructed in accordance with 10-state standards and WTP staff attempted to operate the contact units during the 2006 and 2007 test-runs; however, further lime softening has not been practiced. The inability to soften is due to the time needed for sludge blanket formation and stabilization verses the time allotted for routine WTP test-runs (one week). Also, most pipeline emergencies require the WTP to be capable of distributing potable water within 24-36 hours of plant start-up. We agree that it is not practical to attempt softening given the treatment plant's current operating role; however, if WTP operators wish to become proficient at softening, the duration of routine test runs will need to be increased. The need for future softening; however, will depend on the city's long-term source of drinking water.

Recarbonation:

Type: Pressurized solution feed system
 Number of Units: Two contactor basins - 50ft X 10.6ft X 14ft - 55,800 gal each with baffling
 Detention Time: 4.5 minutes at 18 mgd
 Storage: Liquid CO₂ storage - one 34-ton storage tank - Tomco model WT34CA
 CO₂ Feeder: Two feeders each rated at 325 lbs/hr
 Solution Diffuser: Two multiport diffusers to input CO₂ into the feed water stream

Since lime softening is not practiced, the recarbonation system is not used.

FILTRATION

Type of filter: Declining rate
 Number and Area of Filters: 12 @ 700 sqft each
 Design Filtration Rate: 3.0 gpm/sqft - 3 mgd per filter - 36 mgd total filter capacity
 Approved Filtration Rate: 3.0 gpm/sqft
 Maximum Rate Experienced: 18.2 MGD rate for 1 hour during Sept. 2009 emerg. Op.
 Maximum filtration rate: 4.0 gpm/sqft - filter #8 and #9 for 1 hour during Sept 2009 emerg. Op.
 Is flow equalized through all filters? Yes
 Rate of flow device:
 Flow control valves are provided on the filter effluent piping of each filter - % open - close.
 The flow control valves consist of butterfly valves controlled by an electric operator.

Filter to waste:

Filters 1 -4: Filters 1 & 3 share a common drain. Filters 2 & 4 share a common drain.
 This common drain limits the filter to waste capacity for Filters 1 through 4.

Filters 5-12: The filter to waste lines from each individual filter discharges to a common drain and this piping configuration does not pose a hydraulic limitation.

Filter hours:	Average:	Maximum :	Minimum:
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Filter hours are not available since the WTP test run (one week) concludes prior to filters needing backwash. Filter run hours will become available only if the WTP assumes fulltime operation or test runs of longer duration are performed.

Filter Media - Filters No. #1 - 12 Mixed Media filters

	<u>Anthracite</u>	<u>Sand</u>
Depth - inches	18	12
Effective size (mm):	1 - 1.2	0.45 - 0.55
Uniformity coefficient	<1.5	<1.6

Date Last Rebuilt or Checked: The filters were installed in 2005 and 2006. Each filter was backwashed 3 or 4 times following installation and the depth of the sand and anthracite was measured.

Underdrain Type: General Filter Multi Concrete II -ABS plastic underdrain forms w. plastic media retaining nozzles
 Grading: 4-inch

Water Overflow: None

Surface Wash: None

Depth of Water Above Media: 7.92 feet

Filter Performance Records: - yes, records have been established

Turbidimeters

Is there continuous turbidimeter for each filter? Yes
 Is there continuous turbidimeter for the applied? No, grab samples
 Is there continuous turbidimeter for confluence? Yes, not in use
 Turbidimeter used for combined compliance: NA

Calibration frequency: See comment
 Calibration frequency: See comment
 Calibration frequency: See comment
 Calibration frequency: See comment

Comments:

Continuous turbidimeters are provided for each filter and for filter confluence. Plumbing changes were completed in order to allow the individual filter turbidimeters to function properly in the filter to waste mode. The continuous turbidimeters have been in operation and filter turbidities are monitored during WTP test runs. The filter confluence turbidimeter also monitored turbidity during the 2009 emergency plant runs. During routine WTP test runs none of the filtered water reaches this turbidimeter since the filters are in filter to waste mode.

WTP plant tap maximum turbidity during the Sept 2009 emergency operation was 0.16 NTUs based on lab grab samples collected every 3 hours. The maximum individual filter turbidity was 0.19 NTUs from Filter #9 based on 3 hour grab samples. The maximum individual filter turbidity based on the on-line continuous turbidimeters was less than the turbidity reported from the grab samples from all operating filters during the September 2009 emergency operation.

Backwash: Combined air-water backwash system

Average run length time of filter: NA - WTP test runs are not long enough to determine filter run times.
 Criteria for backwash: End of plant test-run, head-loss for longer runs and turbidity limit.

Source of backwash water:

Water distribution system - two feeds labeled as east and west wash water supply
 The east wash water supply is fed from a 42-inch line with a flow range between 3,500 gpm and 12,000 gpm.
 The west wash water supply is fed from a 24-inch line (hydraulic limitations - 8-inch bottleneck in valve vault)
 The wash water supply lines are equipped with a 16-inch PRV suitable for reducing the pressure from 80 psi to 10 psi at the stated flow range. The PRV consists of a pilot controlled globe valve.

Average duration of backwash: 15 minutes
 Maximum duration of backwash: 15 minutes
 Average backwash flow, gpm: 6300 gpm
 Maximum backwash flow, gpm: 9800 gpm
 Maximum backwash rate - variable rate 5 - 20 gpm/sqft
 Airwash rate: 3 scfm/sqft - 2 blowers each with 1000 cfm at 5.5 psig capacity

The filters are backwashed in the following stages:

Stage 1 - Ramp-up backwash water flow rate from 0 to 2000 gpm - no air, 1.5 minutes duration
 Stage 2 - Ramp-up backwash water flow rate from 2000 to 6300 gpm - with air - 1.0 minute duration
 Stage 3 - Maintain backwash water flow rate at 6300 gpm - with air - 8.0 minutes duration
 Stage 4 - Ramp-up backwash water flow rate from 6300 gpm to 9800 gpm - no air - 2.0 minutes duration
 Stage 5 - Maintain backwash water flow rate at 9800 gpm - no air - 2.5 minutes duration
 Stage 6 - Ramp down backwash water flow rate from 9800 gpm to 0 gpm

Backwash water disposal:

An existing backwash equalization basin between WTP No. 1 and the ozone building stores backwash water. The retained backwash water can either be directed to the head of the ozone treatment or discharged to the sanitary sewer.

Is bed expansion achieved? Yes, bed expansion was tested during equipment shakedown
 Is there loss of media during backwash? A small amount of media was lost (mostly fines) after initial installation
 WTP staff are planning to core the filter media within the next one or two years as part of filter maintenance.

Filter to Waste & Backwash disposal - Unique to Flint WTP

During WTP test runs, production water is filtered to waste and discharged to the Flint River in accordance NPDES General Permit MIG640000 - Certificate of Coverage MIG640053. The COC was renewed on April 1, 2010 and expires on April 1, 2015.

Filter to waste water exits the south side of the WTP facility through a 36-inch line that is connected to an intercept box. The box is divided into two sections by a slide gate valve. During the filter to waste mode, the slide gate valve is open and filter to waste water flows through the intercept box and to a discharge pipe for discharge to the Flint River. After completion of a routine test run, the WTP is shut down and the filters are backwashed. Filtered backwash water is directed from the intercept box to the wastewater transfer pump station. The backwash water is pumped from this station to a backwash retention basin through a 14-inch line. Backwash water is stored in this basin and can either be discharged to the sanitary sewer or recycled to the front of the ozone treatment process. The intercept box design does not allow filter to waste and filter backwashing to be performed simultaneously.

Wastewater flow schematic:

Reference Appendix I

Location of recycled stream into plant flow: Pre-sedimentation basin at the ozonation facility.

Is treatment/equalization provided prior to recycling? Yes

If yes:

Type of treatment: Equalization (storage) of backwash water

Volume of treatment/equalization unit: 820,000 gallons (approx. 4 backwash volumes)

Frequency of recycle stream from unit: Backwash water is not recycled at this time, instead the backwash is discharged to the sanitary sewer through a 10-inch drain and pump.

Chemical used, if any: None

Frequency of solids removal:

Associated problems with filters:

Mudballs - No

Air Binding - No

Cementing - No

Gravel Mounding - No

Media Loss - No

Adequate Backwash Rate - No

Cracking - No

Media Growth - No

Media Attrition - No

Bacteria Growth - No

Uniform Backwash - No

Mudballs - No

Comments:

The filters were installed in 2005 and 2006 as part of the WTP rehabilitation project. The filter electrical controls have required repairs due to a lack of routine operation. Piping to allow for filter monitoring including turbidity, flow rate, and head loss were re-plumbed to allow monitoring of these processes during the filter to waste mode. The monitoring equipment was also re-calibrated. Combined filter effluent turbidity and total flow rate cannot be monitored unless the WTP is sending filter effluent to the 3 mgd clearwell under emergency operation.

Each filter is disinfected in accordance with the AWWA standard for filter disinfection prior to each WTP test-run. Each filter is also backwashed three or four times following completion of each WTP test-run.

MDEQ Conclusions/Recommendations:

WTP operators have gained considerable experience in operation and maintenance of the WTP filters through continued WTP test runs and emergency operation. The WTP filters demonstrated their ability to distribute water meeting the turbidity standard during both of the 2009 emergency operations. Additional experience including determination of filter run times; however, are not possible given the short duration of routine test runs. Longer WTP test runs (10 days or more) would need to be performed to determine filter run times and to become familiar in conducting routine filter backwashes while the WTP is producing water. The co-mingling of treated water from the Flint River with water purchased from DWSD; however is not allowed by the DWSD;

thus, it is also not possible to perform filter backwashes while the WTP is producing water given the constraints with the filter to waste/backwash discharge system. WTP operator must temporarily stop treating water in order to backwash the filters.

The WTP has two sources of backwash water (east wash water supply and west wash water supply). The west wash water supply is provided from a 24-inch main immediately west of the WTP. The ability of the west wash water supply is limited by an existing 8-inch bottleneck within an existing valve vault. This bottleneck needs to be eliminated in order to increase the capacity of the west wash water supply.

WTP staff are planning to core the filter media within the next year or two as part of establishing a routine filter maintenance program. We encourage WTP operators to establish an on-going filter maintenance program that includes filter coring. Other important filter maintenance activities should also be included, such as; rodding, raking, and excavation. These types of activities are typically practiced at other operating WTPs.

PLANT TREATED WATER STORAGE/CLEARWELL

(3 MGAL Well)

Location: Immediately south of Pump Station No. 4

Size: 3.0 mgal

Percent above grade: Totally buried, however top portion is mounded ...less than 20% above grade

Low water level: 11 ft with alarm, 14 ft for high alarm, 15 ft to top - 3 ft operating range

Isolation capabilities: The reservoir can be isolated with slide gate valves.

Vents: Three man-hole vents

Reservoir Baffling: middle baffle wall

Drains: Yes via high service pumping, then portable pump is used to remove remaining water.

Overflow: yes - at 15.5 ft

Access Hatches: three 36-inch circular hatches

Alarms: none, each access hatch is locked

Last Inspection: 1997

C*T credit: See **Appendix H**.

Comments on treated water storage/clearwell:

The reservoir can be isolated with existing slide gate valves. Water can be pumped from the Dort reservoir with the 3 MGAL well out of service. The reservoir is equipped with an internal overflow weir and drain at an elevation of 720 feet. The reservoir also has three manhole vents.

MDEQ Conclusions/Recommendations:

The 3 MGAL Well is due for a routine inspection. The integrity of the concrete base around each of the manhole vents needs to be verified. Any repairs that are needed should be completed at the time of the inspection or shortly after.

CHEMICAL FEED

CHLORINE

Chemical supplied: Gas chlorination, Tablet feeder

UL/NSF approved? Yes

Standard 60 max dose:

Supplier: Alexander Chemical Co.

Chlorine Feed Points:

- 1) Gas feed system for post CL2 - small junction box prior to 3 MGAL clearwell
- 2) Tablet feed system for intermediate CL2 - Plate settler effluent

GAS FEED SYSTEM:**Chlorine Evaporators:**

Two Series 50-200 liquid chlorine evaporators. The chlorine evaporators are needed if the chlorine feed rate exceeds 400 lbs/day.

Chlorinators

Type of Feeders: Five Wallace & Tierman V-notch feeders

Location of vacuum regulators: In the first chlorine storage room

- | | |
|-------|---------------------------------|
| 1) WT | maximum feed rate: 2000 lbs/day |
| 2) WT | maximum feed rate: 2000 lbs/day |
| 3) WT | maximum feed rate: 2000 lbs/day |
| 4) WT | maximum feed rate: 500 lbs/day |
| 5) WT | maximum feed rate: 500 lbs/day |

Chlorine Feed Dosage Determination:

Post Chlorination is not practiced except during emergency operation since the feedpoint is located at the 3 mgal well which also transmits purchased water from Detroit. Based on frequent laboratory bench tests and emergency operation in 2009, WTP operators have determined the chlorine demand through the treatment process to assure sufficient point tap residuals during emergency operation.

Intermediate CL2: Liquid chlorine applied ranges between 3.0 - 4.0 ppm.

3 Mgal Well: Gas CL2 application approximately 1.0 ppm.

Chlorine Room Description:

The chlorine room is located in the NE section of P.S. #4 and consists of two separate rooms. The first room contains the chlorine cylinders, liquid chlorine evaporators, and vacuum regulators. The second room contains the chlorine feeders.

Scales: 2 weigh scales 0 - 8000 lbs are provided. Each scale can weigh two cylinders at a time.

Minimum days of storage:

One 1-ton cylinder is set-up and available for use; however, no more than 1500 pounds of gas chlorine is stored in order to meet process safety management requirements. Additional gas chlorine is available from the waste water treatment plant on short notice.

Gas Chlorine Safety Features/Summary: (Y/N)

NSF Approved - Yes

Air Pack - Yes

Respirators - No - fire dept. responds to CL2 gas leak

Chlorine Leak Alarm - Yes - 0.03 ppm

Leak Detection Bottle - Yes

Cylinder Restraint - cylinders are cradled

Doors Open Outward - Yes

Heater - Yes

Window - Yes - one for each room

Scales - Yes

Panic Hardware - One first door, none on door to CL2 feed room

1st Responders - Yes

Haz-Mat Team - Yes - Genesee County

Inside Access - Yes - via P.S. #4, door sweep not sealed well

Outside Access - Yes

Repair Kit - Yes

Ventilation - Yes

Air Supply - Yes

Fan Switches - Yes, located on wall outside the chlorine storage room.

ments:

Make-up water for the chlorine feed system comes from plant service water. All five chlorinators plant service water is supplied from the city distribution system and has full protection.

All five chlorinators share a single gas vacuum manifold to the raw water and finished water feed points. The cross connection between the low service pump discharge and the 3 MGAL reservoir through the gas vacuum piping has been physically separated. Make-up water to each ejector is plant service water also has full protection.

WTP staff operated the gas chlorine feed equipment during both emergency plant runs in 2009. Intermediate chlorination was installed in 2010 and placed into service in the November 2010 routine test run. Intermediate chlorination reduces the amount of chlorination needed at the 3 Mgal well (post chlorination).

MDEQ Conclusions/Recommendations

Although the local fire department will repond to gas chlorine leaks, air-pack respirators should also be available for WTP operators. Also, the interior entrance door sweep to the chlorine gas storage room needs to be properly sealed in order to reduce the possibility of an accidental gas release from spreading to the rest of Pump Station No. 4.

Intermediate Chlorination: (Tablet Feed System)

Two skid-mounted Constant Chlor Chlorinator units (Model MG-22) are provided at the plate settler effluent utilizing calcium hypochlorite tablets. Each unit's feed capacity is 384 LBs of calcium hypochlorite per day or 250 Lb/day avail CL2. Chlorine tablets are loaded into a briquette hopper and the tablets are dissolved by a spay system using plant service water. The dissolved calcium hypochlorite creates a 1.7% liquid CL2 solution. The chlorine solution is pumped to the treatment flow stream with an LMI Series G (115 GPH) pump at an application rate ranging between 3.0 - 4.0 ppm. The chlorine solution is discharged into an open channel flow leaving the plate settler clarifiers.

Ferric Chloride:

Chemical supplied: 39% ferric chloride

UL/NSF approved? Yes

Standard 60 max dose:

Chemical feed point: Rapid mix

Supplier: PVS Knollwood

Chemical feeders:

	<u>model</u>	<u>max feed rate</u>	<u>min feed rate</u>
1	0.5 HP GE HC pump	2500 ml/min	18 ml/min
2	0.5 HP GE HC pump	2500 ml/min	18 ml/min
3	0.5 HP GE HC pump	2500 ml/min	18 ml/min

Chemical feed dosage determination: Jar-testing

Ferric Dosage Calculation: Ferric is pumped and timed through a graduated cylinder - ml/min

Feeder calibration frequency:

Scales? Side-read strip and sight glass on the bulk storage tanks, ultrasonic level device are also provided on all six tanks.

Chemical Storage: Three bulk storage tanks and three day tanks are provided.

Chlorine storage: Three 6,500 gallon tanks are located in the treatment plant's train shed at the west end of the facility and ferric chloride is piped by gravity to three 2,000 gallon day tanks in the WTP basement. Each of the three tanks have a common 4-inch overflow and 8-inch vent. A sight glass is provided on the side of each tank for level determination. Each tank also has a level sensing system.

Minimum Days of Storage: 27 days

FEED RATE: Approx. 800 lbs/day during WTP test-runs. (based on the emergency operations in 2009)
 FeCL₃ Dosage: Approx. 45.0 mg/l - with range of 25.4 mg/l to 82.6 mg/l depending on raw water turbidity
 Ferric Dosage: Approx. 15.0 mg/l - with range of 8.7 mg/l to 28.4 mg/l

Transfer pumps: None - 2-inch gravity piping from the bulk storage tanks to the day tanks with electrically actuated valves allows for transfer of ferric chloride to the day tanks.

Day tank: Three 2000 gallon tanks located in basement NE and below west softening basin
 Each day tank is equipped with a level sensing system

Spill protection: The bulk storage tanks are dual walled design. The day tanks are contained within a a four foot containment wall.

Piping identification: The ferric piping is color coded accordingly.

Overfeed protection: None

Ferric Comments:

Three ferric feed pumps are provided and the pumps are located within the containment area with the day tanks. Each pump is piped to take suction from its own day tank, however, all three pumps and day tanks are piped and valved such that each pump has the capability to draw off any one of the three day tanks. The feed rate from each pump is adjusted by turning a calibrated screw from between a 0 and 100% setting. Each pump discharges ferric chloride to either the east or west rapid mix basin.

Control system for filling the bulk storage tank and transfer to the day tanks is in place. The system consists of level sensors and electrical control valves that controls filling of the bulk storage tank and transfer rates to the day tanks.

Overflow protection in the event of a control valve failure should be investigated and provided to prevent accidental discharge of ferric into the containment area.

LIME FEED SYSTEM: Not in use

Type: Lime slaking system

Number of Units: Four

Capacity: 2000 lb/hr each

Storage: Four separate lime storage bins (NE, SE, NC, SC) are provided with 120 ton capacity in each bin.
 Plant operators estimate a one week test run uses approximately 80 tons of lime.

Type of Lime: Quicklime - 90% pebble lime

Feed Point: Inlet pipe of solids contact unit

Feeder: Four Wallace & Tierman screw type volumetric feeder - capacity of 32 cuft/hr each.

Quicklime is fed continuously at one end of the slaking compartment. At the other end of the slaker, the paste is charged over a weir into a dilution chamber where a manually controlled continuous water spray converts the paste to a slurry of known concentration. Plant process water is used for make-up water to the slakers.

The lime feed system has not been used in WTP test runs since 2009 due to the time needed to establish a sludge blanket. Moisture problems have also been encountered in the lime storage silos which resulted in operational problems in earlier WTP test runs.

FLUORIDE Not in use

Chemical supplied: System designed for hydrofluosilicic acid, however, the system is not in use nor is any acid stored.

UL/NSF - No chemical or supplier at this time.

Standard 60 max dose: To be determined upon chemical used.

Chemical feed point: Influent to softening clarifier

Supplier: None

Chemical feeders:

	<u>model</u>	<u>max feed rate</u>
1	LMI C721-71 FS	96 gal/day @ 100 psi
2	LMI C721-71 FS	96 gal/day @ 100 psi
3	LMI C721-71 FS	96 gal/day @ 100 psi

Chemical feed dosage determination: Not determined at this time.

Fluoride dosage calculation: A 1000 ml calibration chamber prior to each metering pump is provided.

Feeder calibration frequency: NA.

Scales?

Chemical Storage: Two 55-gallon constant head tanks on 2nd floor of chemical feed room.

Bulk storage: Five intermediate bulk storage tanks are provided, however, these tanks are not connected to the fluoride feed system. These tanks remain unopened on pallets in the WTP basement adjacent to the ferric feed area.

Minimum Days of Storage: See comment

Transfer pumps: See comment

Day tank: See comment

Spill protection: See comment

Piping identification:

Overfeed protection: The fluoride feed pumps are electrically interlocked with the low service pumps and the west-in channel flow meter

Comments:

The bulk storage portion of the fluoride feed system is not set-up at this time. When the installation is complete, hydrofluosilicic acid will be drawn from bulk storage to each one of three 1000 ml calibration chambers then through one of the three metering pumps. The acid will be pumped to one of the 2 constant head tanks where water is added to the acid. The acid solution will then be fed from the constant head tank at an established rate to the influent of each softening unit.

Installation of the fluoride feed system has not been completed and the fluoride feed system has not been operated during routine WTP test-runs. Fluoridation is not practiced as part of routine WTP test runs or emergency operation. Fluoridation will be instituted when the WTP is placed into full time operation.

Flocculation Aid Polymer:**Not in use**

The feed system is installed however, it is not in use. Due to better than expected turbidity removal in the plate settlers this feed system is not expected to be used.

Chemical supplied: None
 UL/NSF approved? NA
 Standard 60 max dose: NA
 Chemical feed point:
 Supplier:

Chemical feeders:

	<u>model</u>	<u>max feed rate</u>
1	LMI C781-34	25 gal/hr @ 30 psi
2	LMI C781-34	25 gal/hr @ 30 psi
3	LMI C781-34	25 gal/hr @ 30 psi

Chemical feed dosage determination: NA

Polymer dosage calculation: NA

Feeder calibration frequency: NA

Scales? None

Chemical Storage: No chemicals are being stored

Bulk storage: None

Maximum Days of Storage: NA

Transfer pumps: NA

Day tank: NA

Spill protection: NA

Piping identification: NA

Overfeed protection: NA

Polymer Comments:

WTP staff may use the LMI feed pumps from the flocculation aid feed system for the softening aid feed system.

Softening Aid Polymer:

Chemical supplied: Claraflocc C-1600 Polyalluminum Chloride

UL/NSF approved - Yes

Standard 60 max dose:

Chemical feed point: Softening basin influent prior to the lime application point.

Supplier: Poly-Dyne

Chemical feeders:

	<u>model</u>	<u>max feed rate</u>	<u>min feed rate</u>
1	Poly-blend & LMI	2 gal/hr	
2	Poly-blend & LMI	2 gal/hr	
3	Poly-blend & LMI	2 gal/hr	

Chemical feed dosage determination: Jar testing

Polymer dosage calculation: see comments below

Feeder calibration frequency: Checked on every WTP test-run, will increase frequency to monthly

Scales? Each day tank has a graduated scale

Chemical Storage: 55-gallon drum stored in room adjacent to the chemical feed room

Bulk storage: None

Minimum Days of Storage: Not determined

Spill protection: None

Piping identification: Yes

Overfeed protection: No

Polymer Comments:

The softening aid system is in use and is used more as a filtering aid.

Optimal polymer dosage is determined by adding different quantities of polymer to a liter of plate settler effluent. The optimal dosage of polymer is then determined in ml of polymer/ L (plate settler effluent). The feed system is configured to apply a specific amount of polymer in gph. For the calculation, the daily flow is changed from mgd to L/min. The determined dosage is then converted from ml/L to mL/min. The dosage determination is then converted from ml/min to gal/hr.

Flow gal/day X 1day/24hrs X 1hr/60min X 3.785L/gal

ml/min X 1L/1000ml X 1gal/3.785 L X 60 min/hr

Coagulation Aid Polymer:

Not in use

Chemical supplied: Not in use

UL/NSF approved?

Standard 60 max dose:

Chemical feed point: Rapid mix

Supplier:

Chemical feeders:

	<u>model</u>	<u>max feed rate</u>	<u>min feed rate</u>
1	Poly-blend - LMI	2 gal/hr	
2	Poly-blend - LMI	2 gal/hr	
3	Poly-blend - LMI	2 gal/hr	

Chemical feed dosage determination: NA

Polymer dosage calculation:

Feeder calibration frequency: NA

Scales? None

Chemical Storage: No polymer stored

Bulk storage: None

Minimum Days of Storage: NA

Transfer pumps: None

Day tank: Removed

Spill protection: None

Piping identification: Yes

Overfeed protection: None

Planner Comments:

The coagulation aid feed system is also not in use. WTP staff do not intend to use the feed system at this time due to adequate coagulation without the polymer.

The coagulation aid feed system has been changed since its initial installation in Segment 3 of the rehabilitation project. The previous feed system was not able to pump the polymer due to its high viscosity. If coagulation aid is used in the future, the chemical will be supplied in a powder form and a solution will be prepared in an existing mechanical mixer located on the second floor above the chemical feed room. The coagulation aid solution will be prepared in a batch process by adding a set amount of powder to a set volume of water in the mixer and transferred from the mixer to the day tanks through 1 1/2-inch piping and a transfer pump. The polymer will then fed by gravity from the day tanks on the second floor to the metering pumps on the first floor for application into the rapid mix.

PLANT PIPING AND MISCELLANEOUS

	<u>pipe diameter</u>	<u>length</u>
Intake pipe:	72-inch	50 Ft
Low service discharge:	48-inch	Approx. 450 Ft to O3 Bldg.
Filter influent:	24-inch	In WTP
Filtered water effluent:	24-inch	In WTP
High service suction header:	36-inch	In P.S. 4
High service discharge:	36-inch	In P.S. 4
Backwash:	24-in (West)	In WTP
	42-in (East)	In WTP
Surface wash:	None	None
6-inch water drain:	16-inch	In WTP
Intake backflush line:	None	None
Sludge drain:	8 to 12-inch	To Bray Rd Lagoon *
Plant service line:	(2 total)	
	24-inch from city	West side of WTP
	42-inch from city	East side of WTP
Do any roof drains or other drains enter treatment process?		No

Pipe Color Coding: In accordance to AWWA standards:

Raw Water - Olive Green	Sludge - Dark Brown
Settled or Clarified - Aqua	Chlorine - Yellow
Finished - Dark Blue	
Backwash - Light Brown	

Plant Cross Connections and Common Walls:

Filter gullets? Yes

Common walls? Yes

Chlorine feed room? Chlorine is applied to filtered water - piping for raw water chlorination remains in place, however, raw water chlorination is not practiced.

Plant water RPZ? All plant service water comes off 6-inch line with a 6-inch RPZ

Chemical feed areas? Plant service water is utilized and full protection is provided.

Surface wash? No surface wash

Boiler? A Wilkins 1032213 RPZ is provided on the make-up waterline to the boiler and the device was recently tested.

Dishwasher? NA

Dehumidifier? Not connected to WTP water supply

Comment on Plant Piping Miscellaneous:

WTP process water is obtained from Flint's distribution system and is protected by a 6-inch RPZ backflow preventer. WTP domestic water is provided by a 2-inch line that tees off the 6-inch process water line just upstream of the RPZ backflow preventer. Plant domestic water serves the bathrooms, lunchroom, and laboratory.

A common wall exists between the filter gullet and filtered water as part of the original construction of the treatment plant. This concern was discussed during the rehabilitation project and any wall cracks that were discovered during the filter rehabilitation were repaired with a sealant. Also, two coats of sealant were applied on the wall separating the filter gullet and the filter box.

Reference **Appendix J** for a filter schematic.

PLANT METERING AND CONTROLS

Plant Domestic Metering: None

Raw Water Metering: Ultrasonic flowmeter after risewell in piping below lime feed room

Ozone System: Meter monitors flow to each ozone chamber

High Service Metering: Venturi meter - information sent to the WTP's SCADA system

Plant Controls:

Chemical Feed

Gas chlorine - manually controlled at Pump Station No. 4. Continuous chlorine monitoring is performed at P.S. #4. The equipment is located at the high service pump discharge.

Tablet CL2 - manually controlled at plate settler effluent

Ferric - at WTP

Fluoride - not provided at this time

Chemical transfer pumps: manual with auto-shutoff

Filters - manual control with status monitoring from SCADA

Filter Backwash - BW is initiated manually, the BW stages can be manual or automatic

Low Service Pumps - Manual operation at P.S. 4

High Service Pumps - manual control from operations center. Low level alarm provided are provided for both reservoirs and the status is reported to the SCADA system.

Elevated Tank - tied to Control Station 2

Plant Alarms:

Basement Flooding - Yes

Chlorine Leak - Yes

Chlorine Supply - Yes

Low Service Intake Well -

Pretreatment Basin Levels - Yes, in Ozone

Pretreatment Sump Pump Failure - Sump alarms

Filter Level - No, has capability through SCADA

Individual filter turbidity - Yes, not in op. yet

FeCl storage tank filling- Yes

CFE turbidity - Yes

Backwash Holding Tank-Weir tank in front of WTP - Yes

High Service Pump Discharge Pressure - Yes

Finished Water Reservoir - Yes

Elevated Storage tanks - Yes

Elevated tank loss of signal - Yes

Main Control System Failure- Back-up power supply

L/H pressure at Baxter & Potter - 72-inch pipeline

Comment on Plant Metering and Controls:

Low level alarm at 3 MG well - 11 ft

Low level alarm at Dort reservoir - 5 ft

Valve Operation:

Are critical valves exercised on a routine basis? See status listed below

Valve LocationExercised

Intake Valves - No

High Service Isolation valves - No

Clearwell Valves - Yes

Influent/Effluent Pretreatment Basins Valving - used in plant test-runs and equipment shakedown

Effluent Flume Valve - No

Low Service Pump Discharge Valving - Yes

WTP treated water effl. valve to 3 Mgal well - Yes

MDEQ Conclusions/Recommendations

The WTP is equipped with numerous valves that are essential for reliable operation. These valves provide the ability to isolate critical components of the WTP. WTP staff need to maintain and expand their program of operating critical WTP valves. Also, an important component of this program is to have an accurate WTP yard piping diagram. The yard piping diagram should denote the location of buried piping on WTP plant grounds and their points of connection to the WTP, reservoirs, control stations, and the elevated tank.

Interruptions in Operation:

Electrical service to the WTP was upgraded during the rehabilitation project. The main circuit to the WTP located northeast of the WTP #1 has been upgraded with primary protection. New circuit breakers were installed and primary protection was provided.

Laboratory Certification:

Comments on laboratory:

Continuous individual filter turbidity trends are compiled during WTP operation.

The laboratory staff have a written procedure in place for ferric jar testing and has compiled operating nomographs for varying operating condition. Procedures for lime and polymer feed have not been developed since they are not being used at this time.

WTP operators have acquired sufficient chlorine demand data with the installation the intermediate chlorination and the dechlorination systems. The laboratory has full microbiological lab certification - 2010 and the certification is due for renewal in 2013. The lab also has on-line chlorine monitoring; however, the monitoring is for monitoring the treatment process and is not reported; thus QA/QC procedures (EPA 600) for the on-line equipment is not required.

TABLE 2: LABORATORY: Purchased Water Operation

Parameter	*Method	Calibration	Sample Points	Sample Frequency
Alkalinity	2320 B. Titration Method	No calibration Standardization of titration chem monthly	Laboratory Tap Baxter & Potter Rd River Intake	1/day 1/day 3/week
Chlorine	4500-Cl G. DPD Colorimetric method 4500-Cl I. Iodometric Electrode Technique	No calibration check results with standard 3 point calibration prior to use of electrode	Laboratory Tap Baxter & Potter Rd Plant Storage Facilities Distribution system	2/day 1/day 2/day 2/week
Fluoride	4500-F C Ion Selective Electrode	2 Point daily calibration	Laboratory Tap Baxter & Potter Rd River Intake	1/day 1/day 1/week
Hardness	2340 C. EDTA Titrimetric Method	No calibration Standardization of titration chemicals.	Laboratory Tap Baxter & Potter Rd River Intake	1/day 1/day 3/week
pH	4500- H+B. Electrometric Method	2 Point daily calibration	Laboratory Tap Baxter & Potter Rd River Intake	1/day 1/day 3/week
Temp.	2550 B. Laboratory & Fields Methods	Acc. check of therm. against NIST certified thermometer	Laboratory Tap River Intake	1/day 3/week
HPC	Index Simplate Method	No cal, sterility check of media & sample vessels. Use of pos. & neg. controls with each test group performed.	Laboratory Tap Distribution system	1/mo 1/mo
Turbidity	2130 B. Nephelometric Method	Daily calibration check with secondary stds, monthly calibration with primary standards	Laboratory Tap Baxter & Potter Rd	3/day 1/day
Coliform	Colilert Presence-Absence Method	No calibration, sterility check of media & sample vessels. Use of pos & neg controls w. each set of sample vessels & media rec.	Laboratory Tap Baxter & Potter Rd Plant storage facilities Distribution system	2/day 1/day 2/day 2/week

TABLE 3: LABORATORY: Test Run Operation

Parameter	Method*	Calibration	Sample Points	Sample Frequency
Alkalinity	2320 B. Titration Method	No calibration, standardization of titration chemicals monthly	River Intake	1/day
			Plate Settler Effluent	Every 2 hours
			Solids Contact Center Mix Well	Every 2 hours
			Filter Effluent	1/day
Total Residual Chlorine	4500 - Cl Iodometric Electrode Technique	3 Point calibration, prior to testing.	River Outfall	Once, Daily
Ozone	4500 - O ₃ Indigo Colorimetric Method	Yearly calibration of Spectrophotometer	Beginning of Contact Chamber #1	Every 4 hours
			Middle of Contact Chamber #2	Every 4 hours
			End of Contact Chamber #3	Every 4 hours
Hardness	2340 C. EDTA Titrimetric Method	No calibration, standardization of titration chemicals.	River Intake	1/day
			Plate Settler Effluent Solids Contact Effluent Filter Effluent	1/day
pH	4500 - H ⁺ B. Electrometric Method	2 Point, daily calibration	River Intake	1/day
			Plate Settler Effluent	
			Solids Contact Center Mix Well	
			Solids Contact Effluent	1/day
Temp.	2550 B. Laboratory & Field Methods	Accuracy check of thermometer regularly against NIST certified thermometer.	River Intake	Every 4 hours
Turbidity	2130 B. Nephelometric Method	Daily calibration check with 2ndary stds, monthly calibration with primary stds.	River Intake	Every 4 hours
			Plate Settler Effluent	Every 4 hours
			Solids Contact Effluent	Every 4 hours
			Filter Effluent	Every 4 hours
Total Susp. Solids	2540 D. Total Suspended Solids Dried at 103-105° C	Daily calibration of analytical balance, and standards tested	River Outfall	Once, Daily
Coliform	Colilert Presence-Absence Method	No calibration, sterility check of media & sample vessels. Use of positive & negative controls with each set of sample vessels.	River Intake - MPN	1/day
	Colilert Quanti-Tray MPN		Plate Settler Effluent	Every 8 hours
			Filter Effluent	Each filter in service, 1/4 hrs

* all methods except for coliform testing come from Standard Methods for the Examination of Water and Wastewater.

Rules and Regulations:

As part of the 1986 amendments to the Federal Safe Drinking Water Act, the Surface Water Treatment Rule (SWTR) was promulgated and became effective June 29, 1993. As part of the 1996 amendments to the Federal Safe Drinking Water Act, the Interim Enhanced Surface Water Treatment Rule (IESWTR) was promulgated and became effective January 1, 2002. These rules and subsequent rules promulgated by the Michigan Department of Environmental Quality under the authority of the MSDWA, as amended, require the following of surface water treatment plants:

1. Maintain a disinfectant residual through the treatment process sufficient to inactivate *Giardia* and viruses. As currently operated, the plant complies with disinfectant residual contact time (C*T) requirements. The C*T calculation was updated as part of this survey and is also included in Appendix H.
2. Rule 325.10720 requires that a residual disinfectant concentration entering the distribution system be no less than 0.2 mg/L. Water suppliers must report to the MDEQ by the end of the next business day if the residual was below 0.2 mg/L. This requirement was met during the emergency operation in 2009 in *Flint* with chlorine. During the time that Flint receives purchased water from DWSD, the incoming chlorine residual has not dropped below 0.2 mg/L.
3. As further noted by Rule 325.10720, equipment must be provided to continuously monitor the chlorine residual leaving the plant. This provision is in place; however, WTP staff do not monitor chlorine residual leaving the WTP on a continuous basis for compliance since the WTP is a stand-by facility.
4. Residual disinfectant in the distribution system measured as total chlorine shall not be undetectable in more than 5% of the samples each month, or HPC counts must be no more than 500. Distribution residuals must be measured and reported whenever coliform samples are collected. Distribution system residuals are collected and reported whenever coliform samples are collected and total residuals have not reported as undetectable in more than 5% of samples collected in any month.
5. Again, as noted by Rule 325.10720, turbidity determinations must be made at least once every 4 hours on samples representative of filtered water while the plant is in operation. A single monitoring point at a location containing effluent from all filters, but prior to storage is ideal for compliance purposes. The compliance point is at the filter confluence. During emergency operation, turbidity samples are collected from the CFE location once every 4 hours. All compliance points must be less than or equal to 0.3 NTU in 95% of samples each month, and at no time exceed 1 NTU.
6. Finally, the MSDWA requires that individual filter turbidity be monitored and recorded every 15 minutes. This information must be recorded and maintained for 3 years to determine compliance with "triggers". Individual filter monitoring and on-line monitoring is maintained during routine WTP test-runs and emergency operation.
7. The Stage 1 of the Disinfectants/Disinfection Byproducts (DBPR) also became effective January 1, 2002 for surface water plant serving over 10,000 people.. This rule reduced the maximum contaminant level (MCL) for total trihalomethanes (TTHM) to 0.080 mg/L and set a MCL of 0.060 mg/L for total haloacetic acids (HAA5). In addition, a maximum disinfectant residual level (MDRL) for chlorine was established. A review of the Monthly Operation Reports and chemical sample results indicate that these water quality standards are being met.
8. The Stage 2 DBPR requires MCL compliance at all TTHM and HAA5 sampling locations rather than averaging results across the system. The Stage 2 IDSE requirements will determine whether treatment plant disinfection modifications will be required. As a customer of DWSD, Flint is on Schedule 1 monitoring and has completed the first year of monitoring in 2012. Flint has met their LRAA and will qualify for reduced monitoring beginning in 2013. Stage 2 DBPR monitoring for Flint in 2013 is discussed further in their 2013 monitoring schedule.
9. The Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) requires increased *Cryptosporidium* treatment for certain vulnerable plants. Since the WTP is a stand-by facility, Crypto monitoring for bin classification was not required. Crypto. monitoring and bin classification will need to be conducted if the city elects to place the WTP into routine operation.

WTP Sanitary Survey Summary

1. Designate a Back-up operator for the WTP. -Page 1
2. Replace switchgear for low service pumps #3 and #4. Page 6
3. Evaluate the future use level of the high service pump station as Flint's involvement in KWA is determined. Page 6
4. Provide adequate stand-by power generation when the WTP assumes fulltime operation. Page 6
5. Provide an additional sampling point in the ozone contact chamber (end of diffusion chamber Cell 1). Page 8
6. Maintain adequate moisture control in the flocculator control room. Page 9
7. Increase the length of WTP test runs if proficiency in softening is needed. Page 10
8. Correct piping constraint in the west wash water supply line. Page 14
9. Provide air-pack respirators for WTP operators for chlorine gas emergency. Page 16
10. Provide proper seal along door sweep for interior entrance door to chlorine gas room. Page 16
11. Inspect the 3 Mgal clearwell, verify integrity of concrete base around each manhole vent and repair as needed. Page 14
12. Expand WTP valve program. Page 23

APPENDIX A

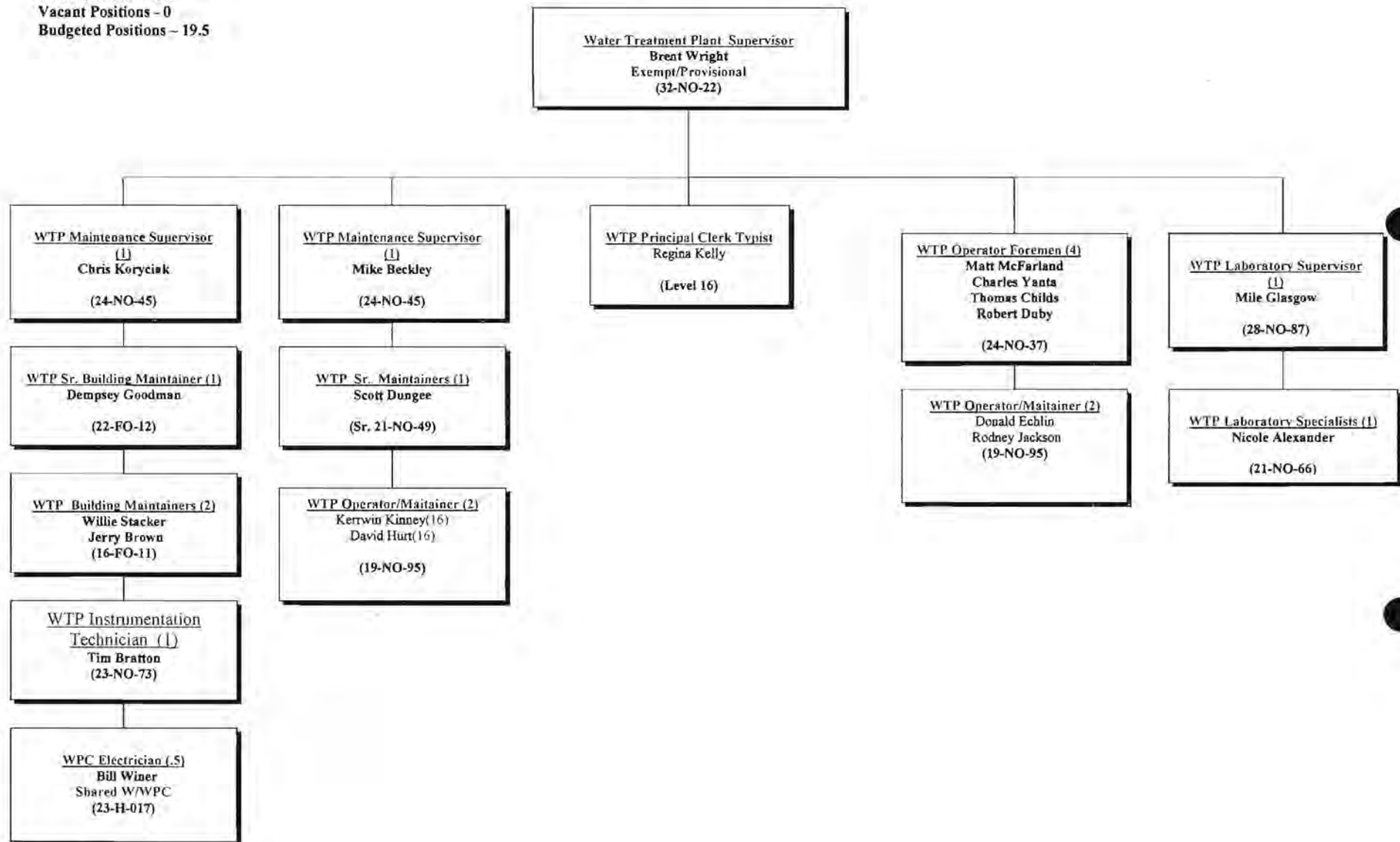
Employee Organizational Chart

WATER TREATMENT PLANT

Personnel Organization Chart

(Fiscal Year 2012)

Active Positions – 19.5
 Vacant Positions – 0
 Budgeted Positions – 19.5



APPENDIX B

WTP Permits - Segs 1-4

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 LINKING WATER AND RADIOLOGICAL PROTECTION DIVISION
PERMIT FOR WATER SYSTEM CONSTRUCTION

THIS PERMIT IS ISSUED UNDER PROVISIONS OF SEC. 4 OF ACT 399, P.A. 1976, AS AMENDED, FOR CONSTRUCTION, OR ALTERATION, OF A WATERWORKS SYSTEM OR PORTIONS THEREOF DESCRIBED HEREON. IT DOES NOT OBVIATE THE NEED TO SATISFY VARIOUS REQUIREMENTS OF OTHER AGENCIES.

Mr. G. Robert Carlyon
 City of Flint Water Plant
 4500 North Dort Highway
 Flint, Michigan 48505

COMMUNITY WATER SUPPLY SECTION
 3423 N MARTIN L KING JR BLVD PO BOX 30630
 LANSING MI 48909-8130

ENVIRONMENTAL HEALTH SECTION
 3423 N MARTIN L KING JR BLVD PO BOX 30630
 LANSING MI 48909-8130

UPPER PENINSULA DISTRICT OFFICE
 305 LUDINGTON STREET
 ESCANABA MI 49829

PERMIT NUMBER
 W991111

DATE ISSUED
 June 23, 1999

ISSUED TO
 City of Flint

2310 ✓

SUBJECT: Water Treatment Plant
 Rehabilitation
 Phase I - Segment 1

ISSUED BY

Michael F. Prysby

Michael F. Prysby, P.E., District Engineer

June 23, 1999

This permit is for the following water system improvements at the Flint Water Treatment Plant in the City of Flint in accordance with plans and specifications prepared and submitted by Snell Environmental Group, Inc.

Boiler Facility:

Installation of a boiler facility heat system for Water Plant No. 2. The system shall consist of three boilers and all related equipment and appurtenances at Water Plant No. 2.

Electrical:

Electrical maintenance building for water plant and water system operations.

SCADA Control:

Installation of Supervisory Control and Data Acquisition (SCADA) control system in the Operations Center in Water Plant No. 2. The system shall consist of a Main Control Panel (MCP) and two complete desktop computer systems in the SCADA Room and will be designed to monitor and control individual facilities including:

- Baxter & Potter Station
- Genesee County Metering Vaults (5 locations)
- Control Station 2

This permit consists of 3 page(s).

This permit is valid for 2 years from date of issuance. If construction is not commenced within 2 years, a permit extension may be applied for in writing by identifying the project and the number on the permit for which the extension is requested.

It is a condition of this permit that the permittee give notice to public utilities pursuant to Act No. 53 of the Public Acts of 1974, as amended (MCLA 460.701 et seq.), and comply with the requirements of that Act.

Issuance of this permit is in compliance with the provisions of Executive Order 1974-4 and issued pursuant thereto.

- 2 MGAL Elevated Tank
- Dort Reservoir Inlet & Outlet
- Control Stations #3 & #5
- Pump Station #4
- Cedar Reservoir & Pump Station #3
- Westside Reservoir & Pump Station #5
- Torrey Road Booster Station
- Three distribution system pressure monitoring stations

Rapid Mix Basins:

Number of Units: 2 upflow units
Size of each: 5.5' X 5.5' X 16' side water depth (SWD); 3620 gallons
Design Capacity: 12,500 gpm (18 MGD) each
Chemicals: Ferric Chloride
Mixers: 5.0 HP plate mount open mixer with adjustable frequency drive (AFD)
 4:1 variable speed control; G-value of 380/sec; 1800 motor rpm;
 100 impeller rpm

Flocculation Basins:

Number of Units: 2
Size of each: 44' X 80.3' X 16' SWD; 422,853 gallons
Design Capacity: 12,500 gpm (18 MGD) each with 34 min. flocculation
Flow-Through Velocity 1.3 fpm
Diameter of Influent Pipe: 36-inch main influent line with five 30-inch outlets
Diameter of Effluent Pipe: Three 36-inch outlets manifolding and increasing to 60-inch prior to future plate settlers
Baffling: Three stages (11.3 minutes detention time per stage @ 18 MGD)
Mixers: 15 (each basin); 2.0 HP vertical propeller units with AFD 10:1
 variable speed control; G-values 30/sec to 80/sec

Chemical Feed:

Modification of the existing coagulant feed system to convey coagulant feed to the new application points at the rapid mix basins including one duplex metering pump rated at 80 GPH @ 100psi. One new metering pump shall be provided as a stand-by.

Additional improvements with the chemical feed facility shall be completed in subsequent segments of the water plant rehabilitation.

Interconnection Structure:

Demolition of the existing primary clarifier and construction of an interconnection structure to convey water from the flocculation basins to the existing secondary basins or future plate settlers.

Since one copy was received, we are retaining it for our records.

MFP:lw

cc: Mr. John O' Malia, P.E., Snell Environmental Group, Inc.
Mr. H. Jack Sargent, Director, Department of Public Works, City of Flint
Mr.. Brian McKenzie, Genesee County Health Department

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 DRINKING WATER AND RADIOLOGICAL PROTECTION DIVISION
PERMIT FOR WATER SYSTEM CONSTRUCTION

THIS PERMIT IS ISSUED UNDER PROVISIONS OF SEC. 4 OF ACT 399, P.A. 1976, AS AMENDED, FOR CONSTRUCTION, OR ALTERATION, OF A WATERWORKS SYSTEM OR PORTIONS THEREOF DESCRIBED HEREON. IT DOES NOT OBVIATE THE NEED TO SATISFY VARIOUS REQUIREMENTS OF OTHER AGENCIES.

Mr. G. Robert Carlyon City of Flint Water Plant 4500 North Dort Highway Flint, Michigan 48505		FIELD OPERATIONS SECTION 3423 N MARTIN L KING JR BLVD PO BOX 30630 LANSING MI 48909-8130	ENVIRONMENTAL HEALTH SECTION 3423 N MARTIN L KING JR BLVD PO BOX 30630 LANSING MI 48909-8130
PERMIT NUMBER W001136	DATE ISSUED June 22, 2000	ISSUED TO City of Flint	2310
SUBJECT: Water Treatment Plant Rehabilitation Phase I - Segment 2		ISSUED BY  ☒ Michael F. Prysby, P.E., District Engineer Shiawassee District Office	

June 22, 2000

This permit is for the following water system improvements at the Flint Water Treatment Plant in the City of Flint in accordance with plans and specifications prepared and submitted by DLZ Michigan, Inc. (Snell Environmental Group, Inc.)

Primary Clarifier Structure:

Number of Units: 1 - Building Footprint 133' 2" x 107' 10"

Three Pretreatment Basins: Each 39.5' x 82' x 17.5' (avg depth). Each basin is equipped with inclined plate settlers and has two (2) 54"x54" inlets and four (4) 24"x24" outlets.

Total Volume: 170,000 cubic feet

Total Rated Capacity of Primary Clarifier: 36 MGD (12 MGD per basin)

Loading Rate: 0.3 gpm/sqft

The primary clarifier is protected against flooding by a 20ft overflow weir from the effluent channel and a 30" diameter outlet that drains to a storm sewer.

Sludge collection is accomplished by a zoned grid of parallel piping under pump suction. The zones are activated by an air-actuated butterfly valve. Two (2) sludge pumps each rated at 350 gpm are provided.

The clarifier basins can be drained via two (2) drain pumps each rated at 350 gpm.

This permit consists of 2 page(s).

This permit is valid for 2 years from date of issuance. If construction is not commenced within 2 years, a permit extension may be applied for in writing by identifying the project and the number on the permit for which the extension is requested.

It is a condition of this permit that the permittee give notice to public utilities pursuant to Act No. 53 of the Public Acts of 1974, as amended (MCLA 460.701 et seq.), and comply with the requirements of that Act.

Issuance of this permit is in compliance with the provisions of Executive Order 1974-4 and issued pursuant thereto.

Site Improvement - Sanitary Sewer Connection

Re-direct the existing plant main drain upstream from the existing filter backwash piping to an existing 36-inch sanitary sewer in Dort Highway. The new connection shall include construction of a 4' diameter manhole with 12-inch HDPE discharge piping from the treatment plant to a proposed lift station. The lift station is equipped with two (2) pumps; one low flow pump rated at 400 gpm at 45' TDH, and one pump rated at 700 gpm at 31' TDH. The station discharges to an 8-inch force main, and is equipped with pump controls and alarms.

Site improvement - Cut and Cap discharge lines from abandoned Plant #1:

- One 42-inch line from the 3 MG Clearwell to the east.
- Two 30-inch lines from Pump Station #1.
- Three 24-inch lines from Pump Station #1.

Building and Grounds Facility

Construction of Building and Grounds Facility adjacent to the existing Electrical Maintenance Building.

Stop Logs and Flume Rehabilitation

Removal of eight (8) stop logs, installation of one (1) sluice gate and all associated concrete work to direct flocculated water to the existing solids contact units.

Repair of side walls, ceiling, and expansion joints of flume transmitting water to the filters.

Four copies of the plans and specifications were received. We are retaining one copy for our records. One copy will be retained by the Environmental Assistance Division and one copy each will be transmitted to the city and their engineer.

MFP:TAB:lw

cc: Mr. John O' Malia, P.E., DLZ Michigan, Inc. (SEG)
 Mr. H. Jack Sargent, Director, Department of Public Works, City of Flint
 Mr. Brian McKenzie, Genesee County Health Department

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 DRINKING WATER AND RADIOLOGICAL PROTECTION DIVISION
PERMIT FOR WATER SYSTEM CONSTRUCTION

THIS PERMIT IS ISSUED UNDER PROVISIONS OF SEC. 4 OF ACT 399, P.A. 1976, AS AMENDED, FOR CONSTRUCTION, OR ALTERATION, OF A WATERWORKS SYSTEM OR PORTIONS THEREOF DESCRIBED HEREON. IT DOES NOT OBTAIN THE NEED TO SATISFY VARIOUS REQUIREMENTS OF OTHER AGENCIES.

Mr. G. Robert Carlyon
 City of Flint Water Plant
 4500 North Dort Highway
 Flint, Michigan 48505

FIELD OPERATIONS SECTION
 3423 N MARTIN L KING JR BLVD PO BOX 30630
 LANSING MI 48909-8130

ENVIRONMENTAL HEALTH SECTION
 3423 N MARTIN L KING JR BLVD PO BOX 30630
 LANSING MI 48909-8130

PERMIT NUMBER W011130	DATE ISSUED November 14, 2001	ISSUED TO City of Flint	2310
SUBJECT: Water Treatment Plant Rehabilitation Phase 1 - Segment 3		ISSUED BY  Michael F. Prysby, P.E., District Engineer Shiawassee District Office	

November 14, 2001

This permit is for the following water system improvements at the Flint Water Treatment Plant in the city of Flint in accordance with plans and specifications prepared and submitted by The DLZ Team.

Softening with Lime Feed:

Number of Units: 1
 Type: Solids contact unit
 Size: 120 ft (diameter) X 15.2 ft deep
 Volume: 1.28 mgal
 Design Capacity: 11,800 gpm (17 mgd)
 Chemicals: Hydrated slaked lime, softening aid polymer, provisions for future soda ash
 Mixer: 1 recirculation drive adjustable through a 6:1 range by use of a variable frequency drive.

Filter Rehabilitation:

Number of Filters: 4
 Size: Filter Box: (area) 28 ft (l) X 25 ft (w) X 9.92 ft (d) (700 sqft)
 Media: Top Layer: 18-inches anthracite, effective size 1.0 – 1.2 mm, uniformity coefficient <1.5
 Bottom Layer: 12-inches sand, effective size 0.45 – 0.55 mm, uniformity coefficient <1.6

This permit consists of 3 page(s).

This permit is valid for 2 years from date of issuance. If construction is not commenced within 2 years, a permit extension may be applied for in writing by identifying the project and the number on the permit for which the extension is requested.

It is a condition of this permit that the permittee give notice to public utilities pursuant to Act No. 53 of the Public Acts of 1974, as amended (MCLA 460.701 et seq.), and comply with the requirements of that Act.

Issuance of this permit is in compliance with the provisions of Executive Order 1974-4 and issued pursuant thereto.

Mr. G. Robert Carlyon
Page 2
November 14, 2001

Filter Rehabilitation Continued:

Water Depth Above Media: 7.92 ft
Design Capacity: 12.0 mgd (3.0 mgd each filter) rated at 3.0 gpm/sqft
Backwash Rate: Variable range to 14 gpm/sqft using a combined air-water backwash system
Airwash Rate: Up to 3 scfm/sqft (2 blowers; 2100 cfm at 6.5 psig each)
Backwash Troughs: General Filter type, 9800 gpm capacity with 2-inch freeboard
Underdrain System: General Filter Multi Concrete II – ABS plastic underdrain forms with plastic media-retaining nozzles

Chemical Feed:

Lime Feed: 2 lime slakers rated at 2000 lbs/hr each, 90% pebble lime from two storage bins sized at 120 tons each.

Re-carbonation:

Storage: One 34 ton CO2 storage tank

Feeder: Two CO2 feeders each rated at 325 lbs/hr

Contact Chamber: Two basins each at 50 ft (l) X 10.6 ft (w) X 14.0 (d) or 55,800 gal each.

Fluoride Feed: Six intermediate bulk storage containers (350 gal each), 3 metering pumps rated at 96 gpd each, two 55 gal constant head tanks, complete with controls interlocked with the low service pump and the west in channel flow meter.

Flocculation Aid

Polymer: Two 30 gal carboys, three metering pumps rated at 0 to 1 gph each.

Softening Aid

Polymer: Three intermediate bulk storage containers (250 gal each), three metering pumps rated at 0 to 2 gph each.

Coagulation Aid

Polymer: Three intermediate bulk storage containers (250 gal each), three metering pumps rated at 0 to 2 gph each.

Raw Water Intake Screens

Provide 2 new intake traveling screens that replace the existing screens just prior to the raw water suction well.

Stop Log and Butterfly Valve Installation:

Install two rectangular butterfly valves to control flow around the west re-carbonation basin.

Mr. G. Robert Carlyon
Page 3
November 14, 2001

Laboratory Facility:

Provide new laboratory with equipment, potable water service, cabinets, furniture, electrical source and controls, telephone and computer cable.

Four copies of the plans and specifications were received. We are retaining one copy for our records. One copy will be retained by the Environmental Assistance Division and one copy each will be transmitted to the city and their engineer.

MFP:TAB:LW

cc: Mr. John O' Malia, P.E., DLZ Michigan, Inc. (SEG)
Mr. H. Jack Sargent, Director, Department of Public Works, City of Flint
Mr. Brian McKenzie, Genesee County Health Department

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 DRINKING WATER AND RADIOLOGICAL PROTECTION DIVISION
PERMIT FOR WATER SYSTEM CONSTRUCTION

THIS PERMIT IS ISSUED UNDER PROVISIONS OF SEC. 4 OF ACT 399, P.A. 1976, AS AMENDED, FOR CONSTRUCTION, OR ALTERATION, OF A WATERWORKS SYSTEM OR PORTIONS THEREOF DESCRIBED HEREON. IT DOES NOT OBVIATE THE NEED TO SATISFY VARIOUS REQUIREMENTS OF OTHER AGENCIES.

Mr. Jeffrey Bryson, Interim Supervisor
 City of Flint Water Treatment Plant
 4500 North Dort Highway
 Flint, Michigan 48505

FIELD OPERATIONS SECTION
 525 W. Allegan, P.O. Box 30630
 LANSING MI 48909-8130

ENVIRONMENTAL HEALTH SECTION
 525 W. Allegan, P.O. Box 30630
 LANSING MI 48909-8130

Shiawassee Michigan District Office
 10650 Bennett Drive
 Morrice, MI 48857-9792

PERMIT NUMBER W021097	DATE ISSUED June 10, 2002	ISSUED TO City of Flint	WSSN NO. 2310
SUBJECT: Water Treatment Plant Rehabilitation Phase 1 - Segment 4		ISSUED BY  Michael F. Prysby, P.E., District Engineer Shiawassee District Office	

June 10, 2002

This permit is for the following water system improvements at the Flint Water Treatment Plant in the City of Flint in accordance with plans and specifications prepared and submitted by The DLZ Team.

Softening with Lime Feed:

Number of Units: 1
 Type: Solids contact unit
 Size: 120 ft (diameter) X 16.2 ft deep
 Volume: 1.38 mgal
 Design Capacity: 13,300 gpm (19.2 mgd)
 Chemicals: Hydrated slaked lime, softening aid polymer, provisions for future soda ash
 Mixer: 1 recirculation drive adjustable through a 6:1 range by use of a variable frequency drive.

Filter Rehabilitation:

Number of Filters: 8
 Size: Filter Box: (area) 28 ft (l) X 25 ft (w) X 9.92 ft (d) (700 sqft)
 Media: Top Layer: 18-inches anthracite, effective size 1.0 – 1.2 mm, uniformity coefficient <1.5
 Bottom Layer: 12-inches sand, effective size 0.45 – 0.55 mm, uniformity coefficient <1.6

This permit consists of 3 page(s).

This permit is valid for 2 years from date of issuance. If construction is not commenced within 2 years, a permit extension may be applied for in writing by identifying the project and the number on the permit for which the extension is requested.

It is a condition of this permit that the permittee give notice to public utilities pursuant to Act No. 53 of the Public Acts of 1974, as amended (MCLA 460.701 et seq.), and comply with the requirements of that Act.

Issuance of this permit is in compliance with the provisions of Executive Order 1974-4 and issued pursuant thereto.

City of Flint Water Treatment Plant

Page 3

June 10, 2002

Filter Backwash Residual Management:

Construct one new 4000 gpm pumping station and wet well located south of the existing water treatment plant administrative offices and west of Pump Station No. 4. The station shall pump intercepted filter wash water to an existing clarifier located just north of Pump Station No. 4. The pumping station shall be equipped with three 2000 gpm submersible pumps.

Three wash water recirculation pumps each rated at 650 gpm at 40 ft. total dynamic head. The recirculation pumps shall pump water from the backwash wastewater retention tank to sedimentation basin just prior to the ozone facility.

Controls/Automation:

Provide monitoring system to be integrated into existing supervisory control and data acquisition (SCADA) system including:

Turbidity Monitoring: Indicate and record turbidity at each filter, the north and south filter effluent piping, and provide filter turbidity alarms.

Ferric Chloride Storage: Provide level sensing system that controls the bulk storage tank filling procedure and valve position during operation.

Flow metering: Provide one ultrasonic flow meter to measure flow to the east clarifier influent.

Locker/Lunch/Meeting Facilities:

Rehabilitate existing space to new mens/womens locker rooms and lunch rooms with equipment, cabinets, furniture, plumbing, etc.

Four copies of the plans and specifications were received. We are retaining one copy for our records. One copy will be retained by the Environmental Assistance Division and one copy each will be transmitted to the city and their engineer.

MFP:TAB:LW

cc: Mr. Mark H. Nye, P.E., DLZ Michigan, Inc.

Mr. G. Robert Carlyon, City of Flint

Ms. Edwynna McKee, Environmental Assistance Division

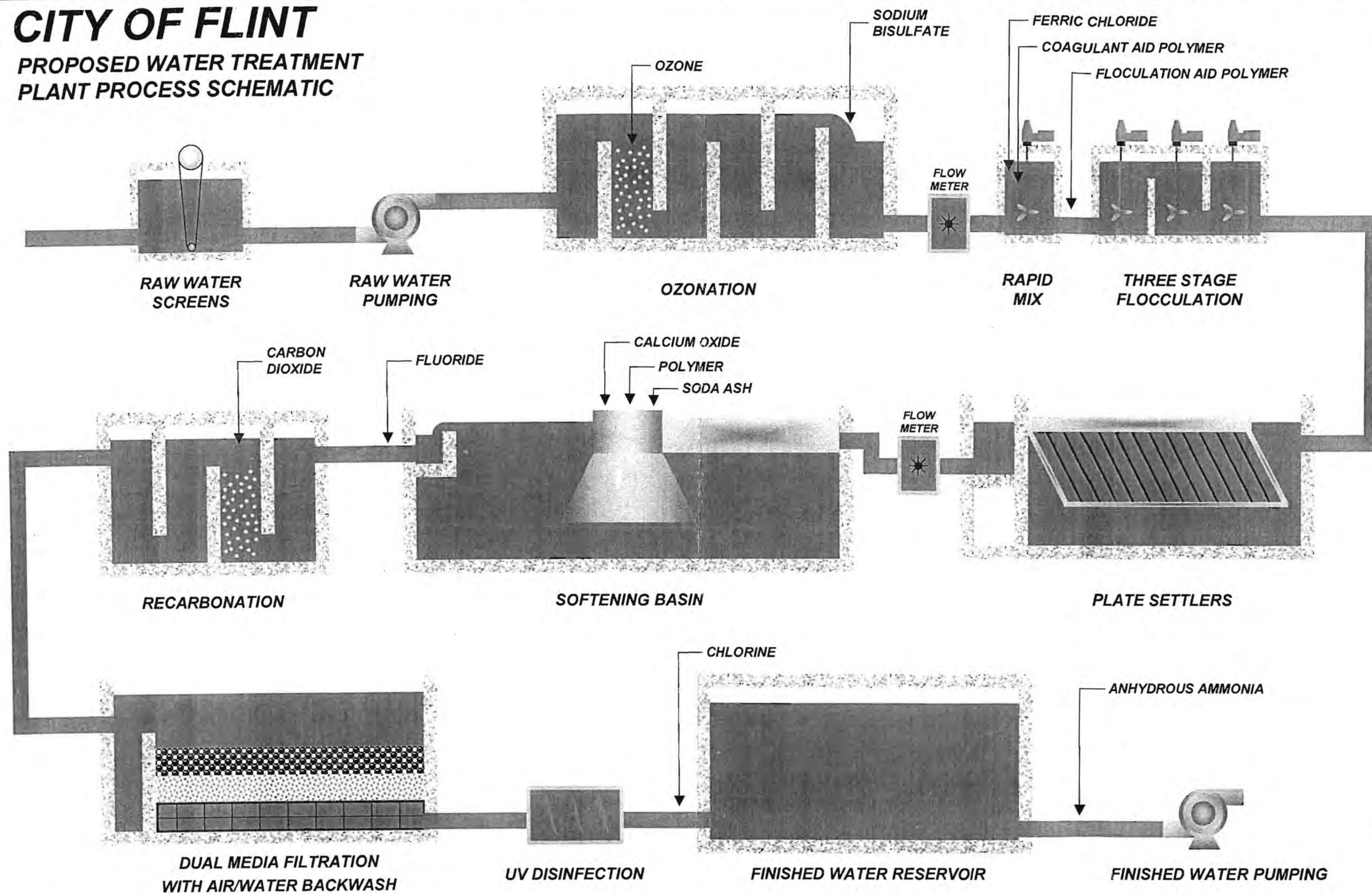
Mr. Brian McKenzie, Genesee County Health Department

APPENDIX C

WTP Flow Diagram

CITY OF FLINT

PROPOSED WATER TREATMENT PLANT PROCESS SCHEMATIC



Usage	Commodity	Color
Water Lines	Raw	Olive green
	Settled or Clarified	Aqua
	Finished or Potable	Dark Blue
Chemical Lines	Alum or Primary Coagulant	Orange
	Ammonia	White
	Carbon Slurry	Black
	Caustic	Yellow with Green Band
	Chlorine (Gas or Solution)	Yellow
	Fluoride	Light Blue with Red Band
	Lime Slurry	Light Green
	Ozone	Yellow with Orange Band
	Phosphate Compounds	Light Green with Red Band
	Polymers or Coagulant Aids	Orange with Green Band
	Potassium Permanganate	Violet
	Soda Ash	Light Green with Orange Band
	Sulfuric Acid	Yellow with Red Band
	Sulfur Dioxide	Light Green with Yellow Band
Waste Lines	Backwash Waste	Light Brown
	Sludge	Dark Brown
	Sewer (Sanitary or Other)	Dark Gray
Other	Compressed Air	Dark Green
	Gas	Red
	Other Lines	Light Gray

APPENDIX D

Monitoring Schedule



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

February 22, 2013

Mr. Robert Bisnick
Water Service Center
3310 East Court Street
Flint, MI 48506

WSSN: 02310
City Of Flint

Dear Mr. Bisnick:

SUBJECT: Drinking Water Monitoring Schedule – 2013
Annual Reports

Enclosed is your Drinking Water Monitoring Schedule for calendar year 2013 outlining the minimum requirements for your public water supply. Collect samples early in the monitoring period of the year indicated on the schedule. If you use a private laboratory you are required to report the results to us within the first ten days of the month following the month that you received the results. To receive credit for monitoring, the "**WSSN**" (water supply serial number), the "**Site Code**," and "**County**" must appear on the sample result. Bottles will NOT be mailed automatically. To order bottles, call the DEQ Laboratory at 517-335-8184. Be certain of the EPA sampling and analysis method requirements for hold times.

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

Also enclosed is the document "2013 Monitoring and Reporting Requirements." This provides additional details about monitoring and reporting requirements. If you have any questions, please contact us at the numbers below.

Sincerely,

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

Adam Rosenthal, EQA
Field Operation Section
Office of Drinking Water and
Municipal Assistance
517-335-6131

MFP:AR:JR

Enclosure
cc/encl: Mr. Brent Wright, W T P Supervisor

2013 Monitoring Schedule

FLINT, CITY OF

WSSN: 02310

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

Location: Distribution System

Sample Type	Collect Samples According to the ...	# Samples/ Frequency	Collect	Site Code	Fee	Unit Number	Test Code
Bacteriological - coliforms	TCR Sampling Site Plan	100/Monthly	Monthly	DIST	\$16.00	30	BPTC
Chlorine Residual	DBP Monitoring Plan	Measure the residual disinfectant level at the same point and at the same time as the bacteriological sample and report the average to the DEQ.					
Lead Copper for corrosion control	Lead and Copper Sampling Pool	23/36 months	Between 06/01 and 09/30/2014	DIST	\$26.00	36CC	CCUB
Water Quality Parameters	Representative Sites	10/3 months	Quarterly	DIST	Various	Various	Various
Total Trihalomethanes	DBP Monitoring Plan	2/3 months	Quarterly	DIST	\$65.00	36VO	CXTM
Haloacetic Acids		2/3 months	Quarterly	DIST	\$130.00	36HA	CXHA

*Need to revise
DBPR2 Monitoring
Plan
Reduced sites*

APPENDIX E

Chemical Analysis

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
LE52512

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: M GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: COMBINED FILTER EFFLUENT
Water System: Other

WSSN/Pool ID:
Source: Other
Site Code:
Collector: Public Water Supply Operator
Date Collected: 10/12/2012 13:00
Date Received: 10/16/2012 12:56
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

NOT TESTED^^^ Not Tested 10/22/2012 NOTST-00-C

Sample analysis was not completed. Sample was lost in laboratory accident due to extractor equipment malfunction. Please resample for test code CXPT.

Antimony	Not detected	10/17/2012	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	10/17/2012	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.05	10/17/2012	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	10/17/2012	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	10/17/2012	0.0003	0.005	EPA 200.8	7440-43-9
Chromium	Not detected	10/17/2012	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	10/22/2012	0.02	0.2	OIA-1677	57-12-5
Lead	Not detected	10/17/2012	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	10/17/2012	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	10/17/2012	0.01	0.1	EPA 200.8	7440-02-0
Selenium	0.001	10/17/2012	0.001	0.05	EPA 200.8	7782-49-2
Thallium	Not detected	10/17/2012	0.0002	0.002	EPA 200.8	7440-28-0

Carbamates by HPLC

3 Hydroxycarbofuran	Not Detected	10/23/2012	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	10/23/2012	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	10/23/2012	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	10/23/2012	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	10/23/2012	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	10/23/2012	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	10/23/2012	0.001		EPA 531.2	2032-65-7

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

LE52512



TESTING INFORMATION

REGULATORY INFORMATION

Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
--------------	------------------	----------------	--------------	------------------	--------	-------

Carbamates by HPLC

Methomyl	Not Detected	10/23/2012	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	10/23/2012	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	10/23/2012	0.001		EPA 531.2	114-26-1

Chlorinated Acid Herbicides

2,4,5-T	Not Detected	10/18/2012	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	10/18/2012	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	10/18/2012	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	10/18/2012	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	10/18/2012	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	10/18/2012	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	10/18/2012	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	10/18/2012	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	10/18/2012	0.001	0.5	EPA 515.4	1918-02-1
TCPPA degradates, mono- and di-acid	Not Detected	10/18/2012	0.001		EPA 515.4	1861-32-1

Volatile Organic Compounds

1,1 Dichloroethane	Not Detected	10/22/2012	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	10/22/2012	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	10/22/2012	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	10/22/2012	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	10/22/2012	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	10/22/2012	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	10/22/2012	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	10/22/2012	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	10/22/2012	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	10/22/2012	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	10/22/2012	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	10/22/2012	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	10/22/2012	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	10/22/2012	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	10/22/2012	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	10/22/2012	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	10/22/2012	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	10/22/2012	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichloropropane	Not Detected	10/22/2012	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	10/22/2012	0.0005	0.005	EPA 524.2	71-43-2

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

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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

LE52512

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Bromobenzene	Not Detected	10/22/2012	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	10/22/2012	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.0050	10/22/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0010	10/22/2012	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	10/22/2012	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	10/22/2012	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	10/22/2012	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.0056	10/22/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	10/22/2012	0.0005		EPA 524.2	75-00-3
Chloroform	0.0029	10/22/2012	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	10/22/2012	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	10/22/2012	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	10/22/2012	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	10/22/2012	0.0005		EPA 524.2	74-95-3
Dibromodifluoromethane	Not Detected	10/22/2012	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	10/22/2012	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	10/22/2012	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	10/22/2012	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	10/22/2012	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	10/22/2012	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	10/22/2012	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	10/22/2012	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	10/22/2012	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	10/22/2012	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	10/22/2012	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	10/22/2012	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	10/22/2012	0.01		EPA 524.2	98-95-3
n-Propylbenzene	Not Detected	10/22/2012	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	10/22/2012	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	10/22/2012	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	10/22/2012	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	10/22/2012	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	10/22/2012	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	10/22/2012	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	10/22/2012	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	10/22/2012	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	10/22/2012	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	10/22/2012	0.0005	1	EPA 524.2	108-88-3

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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 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

LE52512



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Total Trihalomethanes	0.015	10/22/2012	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	10/22/2012	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	10/22/2012	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	10/22/2012	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	10/22/2012	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	10/22/2012	0.0004	0.002	EPA 524.2	75-01-4

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

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

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

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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
LE35013

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:	4500 N DORT HWY, FLINT	Source:	Other
Collected By:	M GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	06/29/2012 11:45
Sample Point:	COMBINED FILTER EFFLUENT - POST 03	Date Received:	07/03/2012 11:37
Water System:	Other	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
^ NOT TESTED^^	Not Tested	07/17/2012				NOTST-00-C
Analysis for volatile organic compounds was not completed within EPA holding time due to a clerical error. Please resample for test code CXVO.						
Antimony	Not detected	07/12/2012	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	07/12/2012	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.05	07/12/2012	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	07/12/2012	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	07/12/2012	0.0003	0.005	EPA 200.8	7440-43-9
Chromium	Not detected	07/12/2012	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	07/09/2012	0.02	0.2	OIA-1677	57-12-5
Sample collection date was not given or incorrect date given. Results will be evaluated by regulating agency.						
Lead	Not detected	07/12/2012	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	07/12/2012	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	07/12/2012	0.01	0.1	EPA 200.8	7440-02-0
Selenium	Not detected	07/12/2012	0.001	0.05	EPA 200.8	7782-49-2
Thallium	Not detected	07/12/2012	0.0002	0.002	EPA 200.8	7440-28-0
Carbamates by HPLC						
3 Hydroxycarbofuran	Not Detected	07/13/2012	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	07/13/2012	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	07/13/2012	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	07/13/2012	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	07/13/2012	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	07/13/2012	0.0005	0.04	EPA 531.2	1563-66-2
ethiocarb	Not Detected	07/13/2012	0.001		EPA 531.2	2032-65-7

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

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Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number**LE35013**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Carbamates by HPLC

Methomyl	Not Detected	07/13/2012	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	07/13/2012	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	07/13/2012	0.001		EPA 531.2	114-26-1

Chlorinated Acid Herbicides

2,4,5-T	Not Detected	07/11/2012	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	07/11/2012	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	07/11/2012	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	07/11/2012	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	07/11/2012	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	07/11/2012	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	07/11/2012	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	07/11/2012	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	07/11/2012	0.001	0.5	EPA 515.4	1918-02-1
Al DCPA degradates, mono- and acid	Not Detected	07/11/2012	0.001		EPA 515.4	1861-32-1

Sample collection date was not given or incorrect date given. Results will be evaluated by regulating agency.

Quality control results for pentachlorophenol were outside allowed limits due to matrix interferences.

Pesticides Analysis by GC/MS

4,4'-DDD	Not Detected	07/09/2012	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	07/09/2012	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	07/09/2012	0.0005		EPA 525.2	50-29-3
Acetochlor	Not Detected	07/09/2012	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	07/09/2012	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	07/09/2012	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	07/09/2012	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	Not Detected	07/09/2012	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	07/09/2012	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	07/09/2012	0.0001	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	07/09/2012	0.001		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	07/09/2012	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	07/09/2012	0.0002	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	07/09/2012	0.0001	0.0002	EPA 525.2	1024-57-3
Hexachlorobenzene	Not Detected	07/09/2012	0.0001	0.001	EPA 525.2	118-74-1
Hexachlorocyclohexane (alpha-BHC)	Not Detected	07/09/2012	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	07/09/2012	0.001		EPA 525.2	319-85-7
Hexachlorocyclohexane (delta-BHC)	Not Detected	07/09/2012	0.001		EPA 525.2	319-86-8

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CFU : Colony Forming Unit

Laboratory Contacts

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Systems Mgmt. Unit Mgr: George Krisztian

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

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USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LE35013

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Pesticides Analysis by GC/MS						
Hexachlorocyclopentadiene	Not Detected	07/09/2012	0.0005	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	07/09/2012	0.0001	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	07/09/2012	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	07/09/2012	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	07/09/2012	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	07/09/2012	0.0005		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1221)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	11104-28-2
PCB (aroclor 1232)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	07/09/2012	0.0001		EPA 525.2	59536-65-1
Quinazoline	Not Detected	07/09/2012	0.0002	0.004	EPA 525.2	122-34-9
Hexachlorocyclopentadiene	Not Detected	07/09/2012	0.001	0.003	EPA 525.2	8001-35-2

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

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

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Laboratory Contacts
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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
LE26411**

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	4500 N DORT HWY, FLINT	Source:	Other
Collected By:	M GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Other
County:	Genesee	Date Collected:	05/03/2012 13:00
Sample Point:	COMBINED FILTER EFFLUENT/POST OZON	Date Received:	05/07/2012 12:35
Water System:	Other	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
*** NOT TESTED***	Not Tested	05/11/2012				NOTST-00-C
CXPT sample was lost in laboratory accident.						
Antimony	Not detected	05/11/2012	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	05/11/2012	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.04	05/11/2012	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	05/11/2012	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	05/11/2012	0.0003	0.005	EPA 200.8	7440-43-9
Chromium	Not detected	05/11/2012	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	05/07/2012	0.02	0.2	OIA-1677	57-12-5
Lead	Not detected	05/11/2012	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	05/11/2012	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	05/11/2012	0.01	0.1	EPA 200.8	7440-02-0
Selenium	Not detected	05/11/2012	0.001	0.05	EPA 200.8	7782-49-2
Thallium	Not detected	05/11/2012	0.0002	0.002	EPA 200.8	7440-28-0
Carbamates by HPLC						
3 Hydroxycarbofuran	Not Detected	05/17/2012	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	05/17/2012	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	05/17/2012	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	05/17/2012	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	05/17/2012	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	05/17/2012	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	05/17/2012	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	05/17/2012	0.001		EPA 531.2	16752-77-5

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Sample Number

LE26411



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Carbamates by HPLC						
Oxamyl	Not Detected	05/17/2012	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	05/17/2012	0.001		EPA 531.2	114-26-1
Chlorinated Acid Herbicides						
2,4,5-T	Not Detected	05/15/2012	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	05/15/2012	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	05/15/2012	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	05/15/2012	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	05/15/2012	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	05/15/2012	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	05/15/2012	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	05/15/2012	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	05/15/2012	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	05/15/2012	0.001		EPA 515.4	1861-32-1

Quality control results for bentazon and acifluorfen were outside allowed limits due to matrix interferences.

Volatile Organic Compounds

1,1 Dichloroethane	Not Detected	05/17/2012	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	05/17/2012	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	05/17/2012	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	05/17/2012	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	05/17/2012	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	05/17/2012	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	05/17/2012	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	05/17/2012	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	05/17/2012	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	05/17/2012	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	05/17/2012	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichloropropane	Not Detected	05/17/2012	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	71-43-2

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
LE26411



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Bromobenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	05/17/2012	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.0065	05/17/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0023	05/17/2012	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	05/17/2012	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	05/17/2012	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.0086	05/17/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	05/17/2012	0.0005		EPA 524.2	75-00-3
Chloroform	0.0023	05/17/2012	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	05/17/2012	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	05/17/2012	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	05/17/2012	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	05/17/2012	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	05/17/2012	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	05/17/2012	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	05/17/2012	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	05/17/2012	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	05/17/2012	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	05/17/2012	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	05/17/2012	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	05/17/2012	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	05/17/2012	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	05/17/2012	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	05/17/2012	0.01		EPA 524.2	98-95-3
n-Propylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	05/17/2012	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	05/17/2012	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	05/17/2012	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	05/17/2012	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	05/17/2012	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	05/17/2012	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	05/17/2012	0.0005	1	EPA 524.2	108-88-3

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

LE26411



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Total Trihalomethanes	0.020	05/17/2012	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	05/17/2012	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	05/17/2012	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	05/17/2012	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	05/17/2012	0.0004	0.002	EPA 524.2	75-01-4

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

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

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

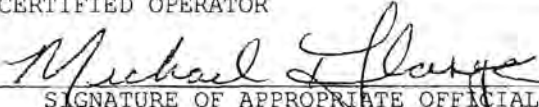
CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

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

APPENDIX F

WTP Test Run Reports

**TEST RUN OPERATION REPORT
OF
WATER TREATMENT PLANT****For Month of October 2012**Flint Water Plant
NAME OF WATER SYSTEM2310
WSSNGenesee
COUNTYMichael Glasgow
CERTIFIED OPERATORDEQ
RESIDUE MANAGEMENT DIVISIONF-1R S-3
CLASSIFICATION
SIGNATURE OF APPROPRIATE OFFICIALFEB 13 2013
LANSING DISTRICT**TREATMENT RATE AND FILTER DATA**

1. Treatment Rate, Maximum 12.2 Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity 36 Million Gallons per Day
3. Average Filter Run 80+ Hours, Average Head Loss n/a Feet
4. Average Filtration Rate 2.4 Gallons per Square Ft. per Minute
5. Maximum Filtration Rate 3.0 Gallons per Square Ft. per Minute
6. Average Wash Water Use n/a percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Oxygen (O₂) on hand _____ lbs.: Estimated supply _____ days
9. Ferric (Fe³⁺) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909



Daily Flow & Ozone Parameters WSSN 2310

October 2012

DATE	Daily Flow (MGD)	O ₃ Dosage (lbs/day)	Ozone residuals (mg/L)												Sodium Bisulfite Dosage (mg/L)
			Contact Chamber #1				Contact Chamber # 2				Contact Chamber # 3				
			# of Samples	Start (avg mg/L)	Middle (avg mg/L)	End (avg mg/L)	# of Samples	Start (avg mg/L)	Middle (avg mg/L)	End (avg mg/L)	# of Samples	Start (avg mg/L)	Middle (avg mg/L)	End (avg mg/L)	
1															
2															
3															
4															
5															
6															
7															
8	5.9	340	6	0.98	0.15	0.08									
9	11.4	348	9	1.10	0.28	0.10									
10	11.0	352	6	1.09	0.38	0.08									
11	10.4	340	6	1.29	0.64	0.10									
12	6.8	335	5	1.41	0.54	0.14									
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															
23															
24															
25															
26															
27															
28															
29															
30															
AVG	9.1	343	6	1.17	0.40	0.10									
MAX	11.4	352	9	1.41	0.64	0.14									
MIN	5.9	335	5	0.98	0.15	0.08									
Total	45.5														



Coagulation & Flocculation Parameters

WSSN 2310

October 2012

D A T E	Ferric Chloride as FeCl ₃ mg/l	Ferric Chloride as Fe 3+ mg/l	Turbidity, NTU units											
			Raw			Plate Settler Effluent			Filter Influent			Filter Effluent		
			# of Samples	Avg.	Max	# of Samples	Avg.	Max	# of Samples	Avg.	Max	# of Samples	Avg.	Max
1														
2														
3														
4														
5														
6														
7														
8	27.1	9.3	7	10.2	11.7	6	1.47	4.25	4	1.17	1.89			
9	29.4	10.1	7	8.9	10.9	9	0.56	1.30	7	0.48	0.76	2	0.18	0.25
10	27.7	9.5	6	8.5	10.7	12	0.45	0.49	6	0.48	0.67	24	0.10	0.23
11	27.8	9.6	6	7.7	8.6	11	0.57	0.87	6	0.53	0.72	24	0.09	0.11
12	28.3	9.8	5	5.6	6.3	7	0.45	0.47	5	0.47	0.52	20	0.07	0.09
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
AVG	28.1	9.7	6	8.2	9.6	9	0.70	1.48	6	0.63	0.91	18	0.11	0.17
MAX	29.4	10.1	7	10.2	11.7	12	1.47	4.25	7	1.17	1.89	24	0.18	0.25
MIN	27.1	9.3	5	5.63	6.3	6	0.45	0.47	4	0.47	0.52	2	0.07	0.09



Flouridation & Chlorination WSSN 2310

October 2012

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l		Chlorine Residual mg/l							
		Raw	Filter Eff.	Dist	Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	Plate Settler Effluent		Contact Clairifier Effluent		Combined Filter Effluent		Combined Filter Effluent (south)	
							Free	Total	Free	Total	Free	Total	Free	Total
1														
2														
3														
4														
5														
6														
7														
8		0.21			2.8		0.6	0.8	0.2	0.5				
9		0.19	0.21		4.2		0.8	1.0	0.4	0.5	0.3	0.5	0.3	0.4
10		0.21	0.22		4.3		1.0	1.2	0.5	0.8	0.3	0.5	0.3	0.5
11		0.22	0.20		4.6		1.0	1.2	0.6	0.8	0.4	0.6	0.4	0.5
12		0.20	0.24		4.7		1.1	1.3	0.5	0.8	0.3	0.5	0.4	0.5
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
AVG		0.21	0.22		4.1		0.9	1.1	0.4	0.7	0.3	0.5	0.4	0.5
MAX		0.22	0.24		4.7		1.1	1.3	0.6	0.8	0.4	0.6	0.4	0.5
MIN		0.19	0.20		2.8		0.6	0.8	0.2	0.5	0.3	0.5	0.3	0.4



Chemical Analyses WSSN 2310

October 2012

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l		Calcium Ca 2+ mg/l		Magnesium as Mg 2+ mg/l		Nitrate as NO ₃ - mg/l		Chloride as Cl - mg/l	
	Raw	Filter Eff.	Raw	Filter Eff.	Raw	Filter Eff.	Raw	Filter Eff.	Raw	Filter Eff.	Raw	Filter Eff.	Raw	Filter Eff.	Raw	Filter Eff.
1																
2																
3																
4																
5																
6																
7																
8	8.33		242		194		48		75.4		13.1				33	
9	8.22	7.17	240	236	194	162	46	74	83.4	81.8	7.8	7.8			35	37
10	8.30	7.37	246	244	190	154	56	90	76.2	72.1	13.6	15.6			33.5	52
11	8.49	7.34	244	236	194	152	50	84	78.6	85	11.7	5.8			38	59
12	8.35	7.38	254	238	194	156	60	82	83.4	74.5	11.2	12.6			33	52
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																
25																
26																
27																
28																
29																
30																
AVG	8.34	7.32	245	239	193	156	52	83	79.4	78.4	11.5	10.5			35	50
MAX	8.49	7.38	254	244	194	162	60	90	83.4	85.0	13.6	15.6			38	59
MIN	8.22	7.17	240	236	190	152	46	74	75.4	72.1	7.8	5.8			33	37



Bacteriological & Physical Parameters

October 2012

D A T E	Total Coliform						Standard Plate Count		Temperature (Celcius)		Color		Odor	
	Raw	Post O3	Plate Settler Eff.	Filter Inf.	Filter Eff.	Lab Tap	Raw	Filter Eff.	Raw	Tap	Raw	Tap	Raw	Tap
1														
2														
3														
4														
5														
6														
7														
8	659	2	1/0	1/0			248		13.9					
9	1553	2	5/0	5/0	8/0		>738	2	12.4					
10	>2419	1	6/1	6/0	24/0		>738	< 2	13.0					
11	1300	1	6/0	6/0	24/0		>738	< 2	11.7					
12	1300	1	5/0	5/0	20/0		>738	< 2	12.3					
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
AVG	* Raw and post-ozone coliform are most probable number maximum daily results.								12.7					
MAX	* Raw HPC counts are daily maximums.								13.9					
MIN									11.7					



PLANT OPERATION REPORT

SEPTEMBER 2009

(SEPTEMBER 8th thru SEPTEMBER 13th)

PLANT OPERATION OVERVIEW (September 8th – 13th 2009)

Plant operation originally began on Monday, August 30th, while the 72" pipeline was being exposed. Upon exposure of the 72" pipe, it was determined that a new section of pipe was necessary to properly fix the problem. Plant operation was suspended until Tuesday, September 8th when a section of pipe was available. The plant was still partially full from the previous run when it went back in operation. The start-up intake flow on was around 12 MGD and filters were put in service the following day. The water plant went in service on Thursday, September 10th and remained in service until Saturday, September 13th when the pipeline repair was complete. Plant flow adjusted slightly during this time, but on average flow was around 13 MGD.

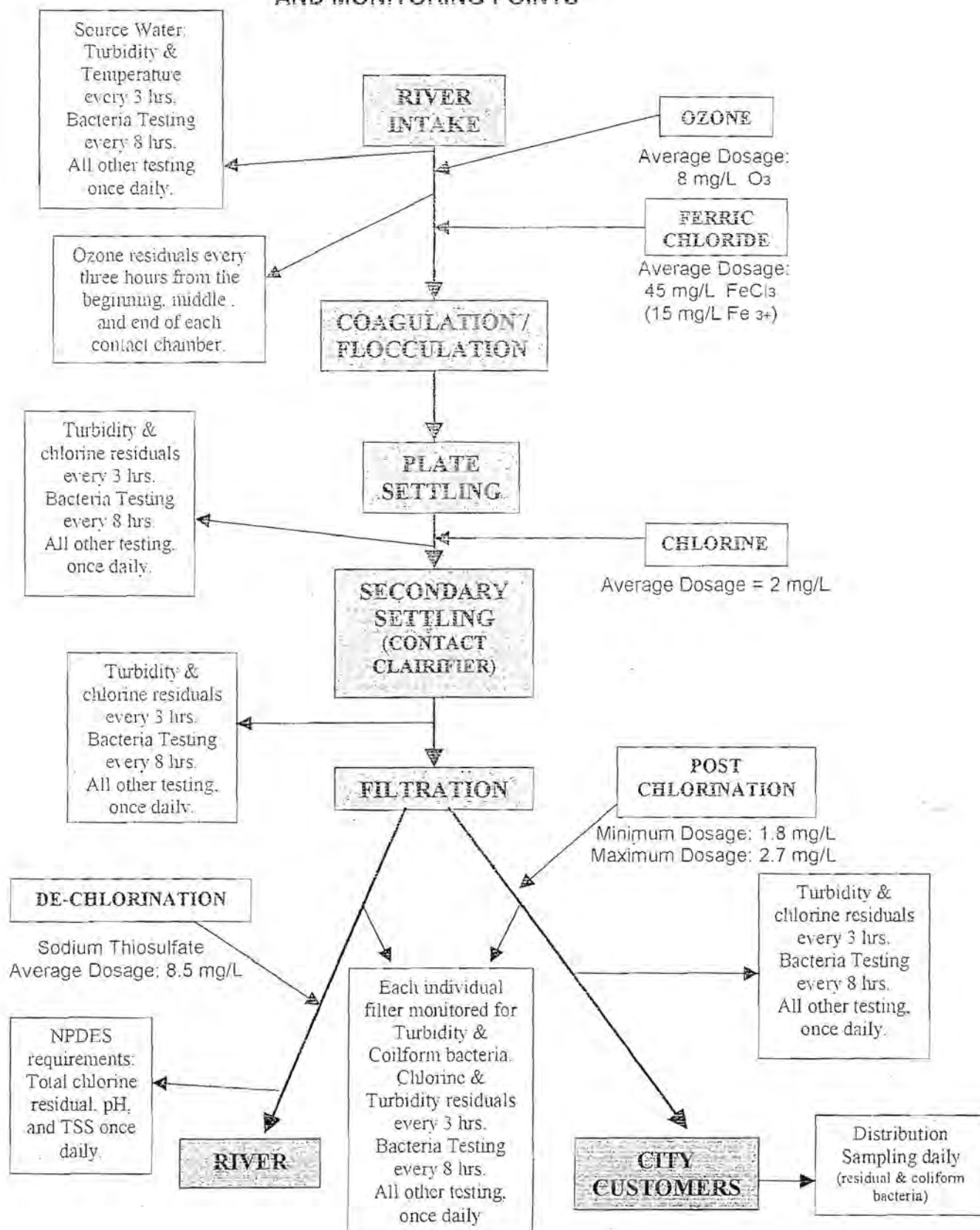
Ozone addition on average was around 8 mg/L. Residuals were observed in the beginning of the contact chambers, however, further along in the basin no residual was achieved. This has been an ongoing issue, which can only be addressed while we are in operation. Although residuals were not present throughout the process, significant bacteria reduction was observed. New programming has been performed for ozone generation, and updates are still being made to address issues that arise.

Ferric chloride dosages were on average near 45 mg/L FeCl_3 (15 mg/L Fe 3+). This relative dosage, along with sufficient mixing and settling produced filter influent turbidities of 0.6 NTU on average, and filter influent turbidities of less than 1 NTU after just 10 hours of operation.

Chlorine was added to plate settler effluent at a dosage of 2 mg/L. This dosage was chosen in an attempt to provide a significant microbial kill and produce a low residual in the filter effluent. As with previous testing and operation, this dosage resulted in negative coliform results in filter influent, and a free residual of 0.2 mg/L and 0.4 mg/L total. When in service, filter effluent residuals were 0.1 mg/L & 0.2 mg/L respectively, and filter turbidities were excellent with the majority of results less than 0.1 NTU. While discharging to the river, the residual was removed with a sodium thiosulfate drip, and the outfall was monitored accordingly. On average the post filtration residuals were 0.2 mg/L total chlorine. The sodium thiosulfate dosage was set high enough to remove a 1 mg/L + chlorine residual. This dosage was higher than necessary, however with our rudimentary set-up it made sense to overdose as to not have any concerns with chlorine being discharged to the river. When the plant began distributing water to the city, post chlorination in the 3 MG well (PS4) was initiated at a dosage of 2 mg/L, and was steadily increased as needed. Distribution samples were collected daily and monitored for chlorine residual & coliform bacteria while water was distributed to the residents. During the days the plant was in service no positive coliform samples appeared in the post chlorination well or in the distribution samples.

The following pages of this report include a diagram of the plant flow process, along with chemical application points and laboratory monitoring points, a copy of the September MOR with the corresponding dates highlighted, and finally, plant process operational data and related lab results.

PLANT FLOW PROCESS, CHEMICAL APPLICATIONS AND MONITORING POINTS





Coagulation Parameters

WSSN 2310

Sep-09

[illegible]



Flouridation & Chlorination

WSSN 2310

DATE	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
					Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well	Tap				
		Raw	Tap	Dist							Free	Free	Free	Free	Free
		14	15	16	17	18	19	20	21	22	23	24	25	26	27
1			1.12					0.9	0.9	0.7	0.8			0.9	
2			1.16					0.9	0.9	0.7	0.8			0.8	
3			1.14					0.9	0.8	0.7	0.9			0.8	
4			1.13					0.8	0.8	0.7	0.9			0.9	
5			1.11					0.8	0.7	0.7	0.8			0.8	
6			1.13					0.8	0.7	0.8	0.7			0.7	
7			1.16					0.9	0.7	0.8	0.7			0.7	
8			1.13					0.8	0.9	0.7	0.8			0.9	
9			1.16					0.9	N/A	N/A	0.8			0.8	
10		0.17	1.13			2.0	2.0	0.8	N/A	N/A	0.7			0.7	
11		0.17	0.30			1.9	2.1	0.8	N/A	N/A	1.3			0.9	
12		0.18	0.21			1.6	2.0	0.8	N/A	N/A	1.3			1.0	
13		0.18	0.20			1.9	2.6	0.8	N/A	N/A	2.9			0.9	
14			1.10					0.9	0.9	1.8	1.1			0.9	
15			1.12					0.9	0.8	1.7	1.5			0.9	
16			1.18					0.9	0.8	1.2	1.3			0.8	
17			1.18					0.8	0.8	1.2	1.1			0.8	
18			1.31					0.8	0.8	0.9	0.9			0.8	
19			1.31					0.9	0.7	0.9	0.9			0.7	
20			1.30					0.8	0.7	0.8	0.9			0.8	
21			1.30					0.9	0.7	0.9	0.9			0.8	
22			1.19					0.9	0.9	0.8	0.8			0.8	
23			1.25					0.9	0.8	0.8	0.8			0.9	
24			1.28					0.8	0.8	0.7	0.8			0.8	
25			1.25					0.8	0.8	0.7	0.8			0.8	
26			1.28					0.9	0.8	0.7	0.8			0.8	
27			1.30					0.9	0.8	0.7	0.8			0.8	
28			1.28					1.0	0.8	0.6	0.8			0.9	
29			1.24					0.9	0.8	0.7	0.8			0.8	
30			1.17					1.0	0.8	0.7	0.8			0.8	
AVG		0.18	1.10			1.9		0.9	0.8	0.9	1.0			0.8	
MAX		0.18	1.31			2.0		1.0	0.9	1.8	2.9			1.0	
MIN		0.17	0.20			1.6		0.8	0.7	0.6	0.7			0.7	



Chemical Analyses

WSSN 2310

DATE	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.29		94		70		24				25.7		7.3		
2		7.24		94		68		26				29.7		4.9		
3		7.20		94		70		24				30.5		4.4		
4		7.23		96		70		26				29.7		5.3		
5		7.24		96		70		26				29.7		5.3		
6		7.11		98		76		22				29.7		5.8		
7		7.12		98		75		23				29.7		5.8		
8		7.23		98		68		20				28.1		6.8		
9		7.24		94		72		22				29.7		4.9		
10	8.31	7.26	210	98	178	73	32	25			71.3	30.5	13.8	5.3		
11	8.29	7.21	208	132	184	196	24	64			68.9	60.9	8.7	10.7		
12	8.22	7.12	204	142	186	212	18	70			68.9	72.9	7.8	7.3		
13	8.19	7.04	208	143	180	220	28	77			68.1	77.8	8.7	6.3		
14		7.25		75		98		23				31.3		4.9		
15		7.24		73		96		23				30.5		4.9		
16		7.20		70		94		24				30.5		4.4		
17		7.43		76		96		20				30.5		4.9		
18		7.16		74		96		22				31.3		4.4		
19		7.13		72		100		28				30.5		5.8		
20		7.19		74		98		24				28.9		6.3		
21		7.15		74		98		24				28.9		6.3		
22		7.16		72		96		24				29.7		5.3		
23		7.17		68		94		26				29.7		4.9		
24		7.22		68		94		26				29.7		4.9		
25		7.18		70		96		26				30.5		4.9		
26		7.24		70		96		26				30.5		4.9		
27		7.13		73		96		23				28.9		5.8		
28		7.29		74		98		24				28.9		6.3		
29		7.25		68		96		28				29.7		5.3		
30		7.18		73		96		23				28.9		5.8		
AVG	8.25	7.20	208	87	182	99	26	29			69.3	33.8	9.8	5.7		
MAX	8.30	7.43	210	143	186	220	32	77			71.3	77.8	13.8	10.7		
MIN	8.19	7.04	204	68	182	68	18	20			68.1	25.7	7.8	4.4		


Bacteriological & Physical Parameters WSSN 2310

D A T E	Total Coliform							Standard Plate Count		Wind Directio n	Temp deg.C	Color		Odor		
	Plant Tap						Raw					Tap	Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Pump	Lab Tap										
	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					19.8		0		0	
2	1/0		2/0	2/0	2/0	2/0					19.7		0		0	
3	1/0		2/0	2/0	2/0	2/0					19.8		0		0	
4	1/0		2/0	2/0	2/0	2/0					19.9		0		0	
5	1/0		2/0	2/0	2/0	2/0					19.8		0		0	
6	1/0		2/0	2/0	2/0	2/0					19.9		0		0	
7	1/0		2/0	2/0	2/0	2/0					20.1		0		0	
8	1/0		2/0	2/0	2/0	2/0					19.8		0		0	
9	1/0		0/0	2/0	0/0	2/0					20.9		0		0	
10	1/0		0/0	2/0	0/0	2/0					19.6		0		0	
11	1/0		2/0	6/0	2/0	2/0		1160	< 2		22.3		0		0	
12	1/0		0/0	8/0	0/0	2/0		1830	< 2		22.5		0		0	
13	1/0		0/0	4/0	2/0	2/0		2990	< 2		22.7		0		0	
14	1/0		2/0	2/0	2/0	2/0					20.5		0		0	
15	1/0		2/0	2/0	2/0	2/0					20.5		0		0	
16	1/0		2/0	2/0	2/0	2/0					20.7		0		0	
17	1/0		2/0	2/0	2/0	2/0					21.5		0		0	
18	1/0		2/0	2/0	2/0	2/0					20.8		0		0	
19	1/0		2/0	2/0	2/0	2/0					21.4		0		0	
20	1/0		2/0	2/0	2/0	2/0					20.9		0		0	
21	1/0		2/0	2/0	2/0	2/0					22.3		0		0	
22	1/0		2/0	2/0	2/0	2/0					21.0		0		0	
23	1/0		2/0	2/0	2/0	2/0					20.9		0		0	
24	1/0		2/0	2/0	2/0	2/0					20.8		0		0	
25	0/0		2/0	2/0	2/0	2/0					20.4		0		0	
26	1/0		2/0	2/0	2/0	2/0					20.4		0		0	
27	1/0		2/0	2/0	2/0	2/0					20.4		0		0	
28	1/0		2/0	2/0	2/0	2/0					20.1		0		0	
29	1/0		2/0	2/0	2/0	2/0					20.1		0		0	
30	1/0		2/0	2/0	2/0	2/0					19.8		0		0	
AVG											20.6		0		0	
MAX											22.7		0		0	
MIN											19.6		0		0	



Distribution System Monitoring

WSSN 2310

DATE	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l															
	1	2	3	4	5	6	7	8	9	10	11	CS	WR	STA II AM	STA II PM	Number of Samples
1														0.9	0.8	2
2												0.3	0.6	1.0	0.8	4
3	0.7	0.5	0.5			0.6	0.5	0.7	0.7	0.1	0.5	0.6	0.3	0.8	0.8	13
4												0.3	0.6	0.8	0.8	4
5														0.7	0.7	2
6														0.7	0.7	2
7														0.7	0.7	2
8	0.4	0.2	closed			0.5	0.3	0.4		0.2	0.4			0.8	0.9	9
9	0.4	0.3	closed			0.3	0.4	0.6	0.7	0.1	0.2			N/A	N/A	8
10	0.5	0.2	0.2						0.5		<0.1			N/A	N/A	4
11	0.4	0.2	closed			0.5	0.4	0.5	0.6	<0.1	0.2			N/A	N/A	7
12	0.4	0.2	closed			0.2	0.1	0.3	0.4	<0.1				N/A	N/A	6
13	0.2	0.3	closed			0.2	0.1	0.1	closed	0.0	closed			0.4	>3.5*	7
14	0.3	0.2	0.1			0.1	0.1	0.3	0.5	0.0	0.4	0.6	<0.1	0.9	0.8	12
15	0.8	0.4	0.4			0.7	0.5	1.7	0.8	0.3	0.6	0.7	0.7	0.8	0.8	13
16	0.5	0.3	0.4			0.6	0.5	0.9	0.6	0.1	0.5	0.7	0.7	0.7	0.8	13
17												0.6	0.7	0.8	0.8	4
18														0.7	0.9	2
19														0.7	0.7	2
20														0.7	0.7	2
21												0.7	0.4	0.7	0.7	4
22	0.6	0.4	0.5			0.6	0.5	0.7	0.7	0.3	0.5	0.5	0.4	0.9	0.9	13
23	0.6	0.4				0.6	0.4	0.5	0.8	0.1	0.5	0.3	0.6	0.7	0.8	12
24	0.5						0.3					0.4	0.5	0.8	0.7	6
25														0.8	0.8	2
26														0.8	0.8	2
27														0.8	0.8	2
28												0.3	0.2	0.8	0.8	4
29	<0.1	0.2	0.3			0.3	0.3	0.3	0.6	<0.1	0.4	0.7	0.3	0.8	0.8	11
30	0.4	0.4	0.4			0.5	0.5	0.5	0.7	0.1	0.4	0.3	0.7	0.8	0.8	13
Monthly Cl ₂ Avg.				0.516												
Quarterly Cl ₂ Avg.				0.604												
Yearly Cl ₂ Avg.				0.683												
Total Samples				191												

* This sample was part of the chlorine slug that passed through after chlorination of pipeline. This water was held in dort reservoir until a true reading below 4.0 mg/L could be obtained. This value was not used in calculation of averages.



Distribution System Monitoring

WSSN 2310

DATE	Total Chlorine Residual at Bacteriological Monitoring Stations mg/l															
	1	2	3	4	5	6	7	8	9	10	11	CS	WR	STA II AM	STA II PM	Number of Samples
1														1.0	1.0	2
2												0.4	0.8	1.1	1.0	4
3	0.8	0.6	0.6			0.7	0.7	0.8	0.9	0.3	0.6	0.8	0.5	0.9	0.9	13
4												0.4	0.7	0.9	0.9	4
5														0.8	0.8	2
6														0.9	0.9	2
7														0.9	0.9	2
8	0.6	0.4	closed			0.6	0.4	0.5		0.3	0.6			0.9	1.0	9
9	0.5	0.4	closed			0.4	0.5	0.7	0.8	0.2	0.4			N/A	N/A	8
10	0.6	0.3	0.4						0.7		0.1			N/A	N/A	5
11	0.5	0.3	closed			0.7	0.6	0.6	0.8	0.1	0.3			N/A	N/A	8
12	0.6	0.3	closed			0.4	0.2	0.5	0.6	0.1				N/A	N/A	7
13	0.3	0.4	closed			0.4	0.3	0.2	closed	0.1	closed			0.5	>3.5*	7
14	0.5	0.3	0.2			0.2	0.2	0.5	0.7	0.2	0.5	0.7	0.2	1.0	1.2	13
15	0.9	0.5	0.5			0.8	0.6	1.9	1.0	0.4	0.8	0.9	0.8	0.9	0.9	13
16	0.7	0.4	0.6			0.8	0.7	1.1	0.8	0.3	0.7	0.9	0.9	0.9	0.9	13
17												0.7	0.8	0.9	1.0	4
18														0.9	1.0	2
19														0.9	1.0	2
20														0.8	0.9	2
21												0.8	0.5	0.9	0.9	4
22	0.8	0.5	0.6			0.8	0.6	0.8	0.8	0.4	0.6	0.6	0.5	1.0	1.0	13
23	0.8	0.5				0.7	0.5	0.7	0.9	0.2	0.6	0.5	0.8	0.9	0.9	12
24	0.6						0.5					0.5	0.5	0.9	0.9	6
25														0.9	0.9	2
26														0.9	0.9	2
27														0.9	0.9	2
28												0.4	0.4	0.9	1.0	4
29	0.1	0.4	0.5			0.5	0.5	0.5	0.8	0.1	0.5	0.9	0.5	0.9	0.9	13
30	0.5	0.5	0.5			0.7	0.6	0.1	0.9	0.2	0.6	0.4	0.9	1.0	1.0	13
Monthly Cl ₂ Avg.				0.651												
Quarterly Cl ₂ Avg.				0.729												
Yearly Cl ₂ Avg.				0.827												
Total Samples				193												

* This sample was part of the chlorine slug that passed through after chlorination of pipeline. This water was held in dort reservoir until a true reading below 4.0 mg/L could be obtained. This value was not used in calculation of averages.



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Total number of positive routine samples:				Total Coliform: <u>3</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
9/10/2009**	Dist. # 11 Salem Housing	Present	Absent	9/11/2009	Dist. # 11 Salem Housing	Absent	Absent
				9/11/2009	B&P Gas Station	Absent	Absent
				9/11/2009	Hinky Dinky Market	Absent	Absent
9/23/2009	Dist. # 1 Rite Aid	Present	Absent	9/24/2009	Dist. # 1 Rite Aid	Absent	Absent
				9/24/2009	Urban League	Absent	Absent
				9/24/2009	Kroger	Absent	Absent
9/23/2009	Dist. # 7 B&P Gas Station	Present	Absent	9/24/2009	Dist. # 7 B&P Gas Station	Absent	Absent
				9/24/2009	Advasure Insurance	Absent	Absent
				9/24/2009	Rite Aid	Absent	Absent
Total number of routine distribution samples analyzed:				187			
Total number of routine distribution samples required:				100			

** This Sample was collected from the distribution system at 10am. The Flint Water Plant went on-line at 12:30p.m.

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DATE:
9/8/2009

FLOCCULATION & SETTLING DATA

TIME	RIVER INTAKE PARAMETERS				PLATE SETTLER PARAMETERS							SOLIDS CONTACT (Secondary Settling)		
	INTAKE FLOW RATE (MGD)	TEMP (C)	TEMP (F)	TURBIDITY (NTU)	FERRIC CHLORIDE FEEDER SETTING (ml/min)	FERRIC CHLORIDE CONVERSIONS		TURBIDITY (NTU)	CHLORINE DOSAGE & RESIDUALS			TURBIDITY (NTU)	CHLORINE RESIDUALS	
						FeCl ₃ (mg/L)	Fe 3+ (mg/L)		Dosage (mg/L)	Free (mg/L)	Total (mg/L)		Free (mg/L)	Total (mg/L)
8:00														
9:00		21.9	71.4	4.50										
10:00														
11:00					2500									
12:00	13.0	22.4	72.3	4.51	2500	40.7	14.0	6.50	1.8	0.2	0.8	0.51	<.1	0.1
13:00	12.0				2500	44.1	15.2		2.0					
14:00	12.0				2500	44.1	15.2		2.0					
15:00	11.0	22.7	72.9	4.32	2500	48.1	16.5	1.57	2.2	0.4	0.7	2.43	0.2	0.3
16:00	11.3				2500	46.8	16.1		2.1					
17:00	11.6				2500	45.6	15.7		2.1					
18:00	10.8	23.0	73.4	4.46	2500	49.0	16.8	0.92	2.2	0.5	0.9	1.41	0.2	0.4
19:00	11.6				2500	45.6	15.7		2.1					
20:00	10.7				2500	49.4	17.0		2.2					
21:00	11.4	23.0	73.4	4.65	2500	46.4	16.0	0.72	2.1	0.6	0.8	0.930	0.2	0.4
22:00	11.8				2500	44.8	15.4		2.0					
23:00	11.7				2500	45.2	15.5		2.0					

MAXIMUM	13.0	23.0	73.4	4.65	2500	49.4	17.0	6.50	2.2	0.6	0.9	2.430	0.2	0.4
MINIMUM	10.7	21.9	71.4	4.32	2500	40.7	14.0	0.715	1.8	0.2	0.7	0.513	0.2	0.1
AVERAGE	11.6	22.6	72.7	4.49	2500	45.8	15.8	2.43	2.1	0.4	0.8	1.32	0.2	0.3

DATE:
9/9/2009

FLOCCULATION & SETTLING DATA

TIME	RIVER INTAKE PARAMETERS				PLATE SETTLER PARAMETERS							SOLIDS CONTACT (Secondary Settling)		
	INTAKE FLOW RATE (MGD)	TEMP (C)	TEMP (F)	TURBIDITY (NTU)	FERRIC CHLORIDE FEEDER SETTING (ml/min)	FERRIC CHLORIDE CONVERSIONS		TURBIDITY (NTU)	CHLORINE DOSAGE & RESIDUALS			TURBIDITY (NTU)	CHLORINE RESIDUALS	
						FeCl ₃ (mg/L)	Fe 3+ (mg/L)		Dosage (mg/L)	Free (mg/L)	Total (mg/L)		Free (mg/L)	Total (mg/L)
0:00	12.1	22.7	72.9	5.03	2500	43.7	15.0	0.683	2.0	0.5	0.7	0.724	0.2	0.4
1:00	11.4				2500	46.4	16.0		2.1					
2:00	12.1				2500	43.6	15.0		2.0					
3:00	12.0	22.5	72.5	5.41	2500	44.1	15.2	0.635	2.0	0.6	0.8	0.686	0.2	0.5
4:00	12.0				2500	44.0	15.1		2.0					
5:00	12.1				2500	43.6	15.0		2.0					
6:00	12.0	22.3	72.1	4.87	2500	44.2	15.2	0.891	2.0	0.5	0.7	0.707	0.2	0.4
7:00	11.9				2500	44.5	15.3		2.0					
8:00	11.9				2500	44.5	15.3		2.0					
9:00	11.9	21.9	71.4	5.52	2500	44.4	15.3	0.587	2.0	0.3	0.7	0.732	0.2	0.3
10:00	12.0				2500	44.0	15.1		2.0					
11:00	11.7				2500	45.2	15.6		2.1					
12:00	12.0	22.4	72.3	5.28	2500	44.1	15.2	0.573	2.0	0.4	0.7	0.593	0.1	0.3
13:00	12.0				2500	44.1	15.2		2.0					
14:00	12.1				2500	43.6	15.0		2.0					
15:00	11.8	22.7	72.9	5.13	2500	44.8	15.4	0.517	2.0	0.2	0.6	0.458	0.1	0.3
16:00	11.8				2500	44.7	15.4		2.0					
17:00	12.0				2500	43.9	15.1		2.0					
18:00	11.6	23.2	73.8	5.38	2500	45.5	15.7	0.545	2.1	0.8	1.1	0.535	0.2	0.4
19:00	11.8				2500	44.7	15.4		2.0					
20:00	11.5				2500	46.0	15.8		2.1					
21:00	11.9	23.0	73.4	4.96	2500	44.6	15.4	0.591	2.0	0.8	1.0	0.569	0.3	0.5
22:00	11.6				2500	45.5	15.6		2.1					
23:00	11.4				2500	46.3	15.9		2.1					

MAXIMUM	12.1	23.2	73.8	5.52
MINIMUM	11.4	21.9	71.4	4.87
AVERAGE	11.9	22.6	72.7	5.20

2500	46.4	16.0	0.891	2.1	0.8	1.1
2500	43.6	15.0	0.517	2.0	0.2	0.6
2500	44.6	15.3	0.628	2.0	0.5	0.8

0.732	0.3	0.5
0.458	0.1	0.3
0.626	0.2	0.4

DATE:
9/10/2009

FLOCCULATION & SETTLING DATA

TIME	RIVER INTAKE PARAMETERS				PLATE SETTLER PARAMETERS							SOLIDS CONTACT (Secondary Settling)		
	INTAKE FLOW RATE (MGD)	TEMP (C)	TEMP (F)	TURBIDITY (NTU)	FERRIC CHLORIDE FEEDER SETTING (ml/min)	FERRIC CHLORIDE CONVERSIONS		TURBIDITY (NTU)	CHLORINE DOSAGE & RESIDUALS			TURBIDITY (NTU)	CHLORINE RESIDUALS	
						FeCl ₃ (mg/L)	Fe 3+ (mg/L)		Dosage (mg/L)	Free (mg/L)	Total (mg/L)		Free (mg/L)	Total (mg/L)
0:00	11.5	22.8	73.0	4.89	2600	47.7	16.4	0.515	2.1	0.7	0.9	0.481	0.4	0.5
1:00	11.7				2500	45.1	15.5		2.0					
2:00	11.9				2500	44.5	15.3		2.0					
3:00	11.8	22.8	73.0	5.02	2500	45.0	15.5	0.465	2.0	0.7	0.9	0.427	0.3	0.5
4:00	11.9				2500	44.6	15.3		2.0					
5:00	11.9				2500	44.3	15.2		2.0					
6:00	11.8	22.7	72.9	5.23	2500	44.9	15.4	0.404	2.0	0.8	0.9	0.424	0.4	0.5
7:00	11.6				2500	45.5	15.7		2.1					
8:00	12.0				2500	44.0	15.1		2.0					
9:00	11.8	22.6	72.7	5.15	2500	45.0	15.5	0.430	2.0	0.5	0.9	0.435	0.3	0.5
10:00	11.8				2500	44.7	15.4		2.0					
11:00	11.7				2500	45.2	15.6		2.1					
12:00	11.7	22.9	73.2	5.44	2600	46.9	16.1	0.421	2.0	0.6	0.8	0.425	0.1	0.3
13:00	12.1				2600	45.3	15.6		2.0					
14:00	12.5				2500	42.4	14.6		1.9					
15:00	11.8	23.4	74.1	4.72	2500	44.7	15.4	0.471	2.0	2.2	2.3	0.405	0.3	0.6
16:00	11.7				2500	45.3	15.6		2.1	2.3	2.5			
17:00	12.5				2500	42.4	14.6		1.9					
18:00	13.7	23.7	74.7	3.86	2500	38.5	13.2	0.750	1.7	1.3	1.5	0.451	1.1	1.3
19:00	13.2				2500	40.0	13.8		1.8					
20:00	13.6				2500	39.0	13.4		1.8					
21:00	13.5	23.3	73.9	4.23	2500	39.1	13.4	1.09	1.8	1.2	1.5	0.638	1.0	1.2
22:00	13.8				2700	41.4	14.2		1.7					
23:00	13.3				2700	43.1	14.8		1.8					

MAXIMUM	13.8	23.7	74.7	5.44	2700	47.7	16.4	1.09	2.1	2.3	2.5	0.638	1.1	1.3
MINIMUM	11.5	22.6	72.7	3.86	2500	38.5	13.2	0.404	1.7	0.5	0.8	0.405	0.1	0.3
AVERAGE	12.3	23.0	73.4	4.82	2529	43.7	15.0	0.568	2.0	1.1	1.4	0.461	0.5	0.7

DATE:
9/11/2009

FLOCCULATION & SETTLING DATA

TIME	RIVER INTAKE PARAMETERS				PLATE SETTLER PARAMETERS							SOLIDS CONTACT (Secondary Settling)		
	INTAKE FLOW RATE (MGD)	TEMP (C)	TEMP (F)	TURBIDITY (NTU)	FERRIC CHLORIDE FEEDER SETTING (ml/min)	FERRIC CHLORIDE CONVERSIONS		TURBIDITY (NTU)	CHLORINE DOSAGE & RESIDUALS			TURBIDITY (NTU)	CHLORINE RESIDUALS	
						FeCl ₃ (mg/L)	Fe ³⁺ (mg/L)		Dosage (mg/L)	Free (mg/L)	Total (mg/L)		Free (mg/L)	Total (mg/L)
0:00	13.8	23.3	73.9	4.52	2700	41.5	14.3	0.487	1.7	1.1	1.3	0.512	0.6	0.8
1:00	13.6				2700	42.0	14.5		1.8					
2:00	13.3				2700	42.8	14.7		1.8					
3:00	13.6	23.5	74.3	4.31	2700	41.9	14.4	0.554	1.8	1.1	1.3	0.466	0.5	0.7
4:00	11.9				2700	48.0	16.5		2.0					
5:00	11.8				2800	50.4	17.3		2.0					
6:00	11.5	23.3	73.9	4.07	2700	49.7	17.1	0.430	2.1	1.2	1.4	0.475	0.7	0.9
7:00	11.1				2700	51.3	17.7		2.2					
8:00	11.2				2700	50.9	17.5		2.1					
9:00	13.3	23.0	73.4	4.58	2700	42.8	14.7	0.395	1.8	0.5	0.8	0.432	0.2	0.5
10:00	13.2				2700	43.4	14.9		1.8					
11:00	13.3				2800	44.5	15.3		1.8					
12:00	13.2	23.1	73.6	6.18	2700	43.2	14.8	0.533	1.8	0.3	0.6	0.450	0.2	0.3
13:00	15.1				2800	39.2	13.5		1.6					
14:00	15.3				2800	38.8	13.4		1.6					
15:00	6.9	23.3	73.9	5.43	2700	82.6	28.4	0.659	3.5	0.4	0.6	0.504	0.1	0.3
16:00	15.2				2800	39.0	13.4		1.6	0.1	0.3			
17:00	15.2				2800	39.0	13.4		1.6					
18:00	15.1	23.6	74.5	5.90	2700	37.8	13.0	0.624	1.6	0.3	0.6	0.667	0.2	0.3
19:00	15.0				2800	39.5	13.6		1.6					
20:00	15.1				2800	39.3	13.5		1.6	2.2	2.6			
21:00	14.9	23.3	73.9	5.40	2800	39.6	13.6	0.562	1.6	1.0	1.2	0.638	0.5	0.6
22:00	15.0				2700	38.1	13.1		1.6	0.9	1.1			
23:00	7.4				2700	77.6	26.7		3.3					

MAXIMUM	15.3	23.6	74.5	6.18
MINIMUM	6.9	23.0	73.4	4.07
AVERAGE	13.1	23.3	73.9	5.05

2800	82.6	28.4	0.659	3.5	2.2	2.6
2700	37.8	13.0	0.395	1.6	0.1	0.3
2738	46.0	15.8	0.531	1.9	0.8	1.1

0.667	0.7	0.9
0.432	0.1	0.3
0.518	0.4	0.6

DATE:
9/12/2009

FLOCCULATION & SETTLING DATA

TIME	RIVER INTAKE PARAMETERS				PLATE SETTLER PARAMETERS							SOLIDS CONTACT (Secondary Settling)		
	INTAKE FLOW RATE (MGD)	TEMP (C)	TEMP (F)	TURBIDITY (NTU)	FERRIC CHLORIDE FEEDER SETTING (ml/min)	FERRIC CHLORIDE CONVERSIONS		TURBIDITY (NTU)	CHLORINE DOSAGE & RESIDUALS			TURBIDITY (NTU)	CHLORINE RESIDUALS	
						FeCl ₃ (mg/L)	Fe 3+ (mg/L)		Dosage (mg/L)	Free (mg/L)	Total (mg/L)		Free (mg/L)	Total (mg/L)
0:00	15.1	23.1	73.6	4.98	2800	39.2	13.5	0.626	1.6	0.7	0.9	0.541	0.4	0.6
1:00	15.9				2700	36.0	12.4		1.5					
2:00	13.3				2800	44.5	15.3		1.8					
3:00	15.7	22.9	73.2	5.31	3000	40.5	13.9	0.656	1.5	0.6	0.3	0.535	0.2	0.4
4:00	14.8				3000	42.9	14.8		1.6					
5:00	15.2				3000	41.7	14.4		1.6					
6:00	15.0	22.9	73.2	4.50	3000	42.2	14.5	0.643	1.6	0.3	0.5	0.608	0.1	0.4
7:00	15.7				3000	40.3	13.9		1.5					
8:00	16.3				3000	38.9	13.4		1.5					
9:00	16.4	22.7	72.9	3.50	3000	38.7	13.3	0.429	1.5	0.4	0.5	0.487	0.1	0.4
10:00	16.3				3000	38.9	13.4		1.5					
11:00	16.2				3000	39.2	13.5		1.5					
12:00	16.3	23.0	73.4	2.98	3000	39.0	13.4	0.580	1.5	0.3	0.4	0.476	0.1	0.4
13:00	16.1				3000	39.3	13.5		1.5					
14:00	16.3				3000	38.9	13.4		1.5	0.3	0.6			
15:00	16.0	23.5	74.3	4.41	3000	39.7	13.6	0.529	1.5	0.3	0.5	0.484	0.1	0.3
16:00	9.9				3000	64.3	22.1		2.4	0.3	0.5			
17:00	11.3				3000	56.2	19.3		2.1	0.3	0.4			
18:00	9.8	23.7	74.7	4.79	3000	65.1	22.4	0.695	2.5	0.3	0.6	0.622	0.2	0.3
19:00	16.0				3000	39.7	13.6		1.5	0.3	0.4			
20:00	16.1				N.R.	N/A	N/A		1.5	0.4	0.7			
21:00	N.R.	23.1	73.6	5.13	N.R.	N/A	N/A	0.496		0.1	0.3	0.557	0.1	0.2
22:00	N.R.				N.R.	N/A	N/A							
23:00	N.R.				N.R.	N/A	N/A							

MAXIMUM	16.4	23.7	74.7	5.31	3000	65.1	22.4	0.695	2.5	0.7	0.9	0.622	0.4	0.6
MINIMUM	9.8	22.7	72.9	2.98	2700	36.0	12.4	0.429	1.5	0.1	0.3	0.476	0.1	0.2
AVERAGE	14.9	23.1	73.6	4.45	2965	43.3	14.9	0.582	1.6	0.4	0.5	0.539	0.2	0.4

DATE:
9/13/2009

FLOCCULATION & SETTLING DATA

TIME	RIVER INTAKE PARAMETERS				PLATE SETTLER PARAMETERS							SOLIDS CONTACT (Secondary Settling)		
	INTAKE FLOW RATE (MGD)	TEMP (C)	TEMP (F)	TURBIDITY (NTU)	FERRIC CHLORIDE FEEDER SETTING (ml/min)	FERRIC CHLORIDE CONVERSIONS		TURBIDITY (NTU)	CHLORINE DOSAGE & RESIDUALS			TURBIDITY (NTU)	CHLORINE RESIDUALS	
						FeCl ₃ (mg/L)	Fe 3+ (mg/L)		Dosage (mg/L)	Free (mg/L)	Total (mg/L)		Free (mg/L)	Total (mg/L)
0:00	11.7	23.0	73.4	4.27	3000	54.2	18.7	0.441	2.0	0.3	0.4	0.503	0.2	0.3
1:00	11.8				3000	53.8	18.5		2.0					
2:00	11.7				3000	54.3	18.7		2.1	0.3	0.3			
3:00	11.6	22.9	73.2	4.18	3000	54.6	18.8	0.358	2.1	1.6	2.2	0.443	0.2	0.3
4:00	11.6				3000	54.6	18.8		2.1					
5:00	11.7				3000	54.4	18.7		2.1					
6:00	15.4				3000	41.2	14.2		1.6	0.2	0.3		1.1	1.5
7:00	15.5				3000	41.0	14.1		1.6					
8:00	15.6				3000	40.8	14.0		1.5	< 0.1	< 0.1		< 0.1	< 0.1
9:00	N.R.	22.3	72.1	5.80	OFF			0.407				0.323		
10:00	N.R.				OFF									
11:00	N.R.				OFF									
MAXIMUM	15.6	23.0	73.4	5.80	3000	54.6	18.8	0.441	2.1	1.6	2.2	0.503	1.1	1.5
MINIMUM	11.6	22.3	72.1	4.18	3000	40.8	14.0	0.358	1.5	0.2	0.3	0.323	0.2	0.3
AVERAGE	12.9	22.7	72.9	4.75	3000	49.9	17.2	0.402	1.9	0.6	0.8	0.423	0.5	0.7

WATER PLANT LABORATORY DATA - OZONE

DATE:
9/8/2009

TIME	INTAKE FLOW RATE (MGD)	O ₃ DOSAGES		OZONE RESIDUALS								
		O ₃ (lbs/day)	O ₃ (mg/L)	CHAMBER 1 Residual # 1 (mg/L)	CHAMBER 1 Residual # 2 (mg/L)	CHAMBER 1 Residual # 3 (mg/L)	CHAMBER 2 Residual # 4 (mg/L)	CHAMBER 2 Residual # 5 (mg/L)	CHAMBER 2 Residual # 6 (mg/L)	CHAMBER 3 Residual # 7 (mg/L)	CHAMBER 3 Residual # 8 (mg/L)	CHAMBER 3 Residual # (mg/L)
12:00	13.0	930	8.6	0.21	0.00	N/A	0.29	0.00	N/A	0.56	0.00	N/A
13:00	12.0	1101	11.0									
14:00	12.0	1073	10.7									
15:00	11.0	994	10.8	0.23	0.02	N/A	0.41	0.00	N/A	0.42	0.00	N/A
16:00	11.3	999	10.6									
17:00	11.6	1000	10.3									
18:00	10.8	998	11.1	0.17	0.00	N/A	0.43	0.00	N/A	0.44	0.00	N/A
19:00	11.6	1015	10.5									
20:00	10.7	987	11.1									
21:00	11.4	997	10.5	0.25	0.00	N/A	0.30	0.00	N/A	0.63	0.00	N/A
22:00	11.8	1003	10.2									
23:00	11.7	987	10.1									
MAXIMUM	13.0	1101	11.1	0.25	0.02	N/A	0.43	0.00	N/A	0.63	0.00	N/A
MINIMUM	10.7	930	8.6	0.17	0.00	N/A	0.29	0.00	N/A	0.42	0.00	N/A
AVERAGE	11.6	1007	10.5	0.22	0.01	N/A	0.36	0.00	N/A	0.51	0.00	N/A

DATE:

9/9/2009

WATER PLANT LABORATORY DATA - OZONE

TIME	INTAKE FLOW RATE (MGD)	O ₃ DOSAGES		OZONE RESIDUALS								
		O ₃ (lbs/day)	O ₃ (mg/L)	CHAMBER 1 Residual # 1 (mg/L)	CHAMBER 1 Residual # 2 (mg/L)	CHAMBER 1 Residual # 3 (mg/L)	CHAMBER 2 Residual # 4 (mg/L)	CHAMBER 2 Residual # 5 (mg/L)	CHAMBER 2 Residual # 6 (mg/L)	CHAMBER 3 Residual # 7 (mg/L)	CHAMBER 3 Residual # 8 (mg/L)	CHAMBER 3 Residual # (mg/L)
0:00	12.1	960	9.5	0.15	0.00	N/A	0.37	0.00	N/A	0.35	0.00	N/A
1:00	11.4	1000	10.5									
2:00	12.1	1012	10.0									
3:00	12.0	998	10.0	0.23	0.00	N/A	0.42	0.00	N/A	0.26	0.00	N/A
4:00	12.0	988	9.9									
5:00	12.1	1003	9.9									
6:00	12.0	983	9.8	0.18	0.00	N/A	0.22	0.00	N/A	0.25	0.00	N/A
7:00	11.9	963	9.7									
8:00	11.9	981	9.9									
9:00	11.9	970	9.8	0.10	0.00	N/A	0.27	0.00	N/A	0.20	0.00	N/A
10:00	12.0	967	9.7									
11:00	11.7	1002	10.3									
12:00	12.0	991	9.9	0.14	0.00	N/A	0.05	0.00	N/A	0.25	0.00	N/A
13:00	12.0	990	9.9									
14:00	12.1	984	9.7									
15:00	11.8	988	10.0	0.29	0.00	N/A	0.50	0.00	N/A	0.51	0.00	N/A
16:00	11.8	996	10.1									
17:00	12.0	987	9.8									
18:00	11.6	1004	10.4	0.12	0.00	N/A	0.38	0.00	N/A	0.61	0.00	N/A
19:00	11.8	1001	10.1									
20:00	11.5	973	10.2									
21:00	11.9	970	9.8	0.42	0.00	N/A	0.24	0.00	N/A	0.44	0.00	N/A
22:00	11.6	985	10.2									
23:00	11.4	1002	10.5									

MAXIMUM	12.1	1012	10.5	0.42	0.00	N/A	0.50	0.00	N/A	0.61	0.00	N/A
MINIMUM	11.4	960	9.5	0.10	0.00	N/A	0.05	0.00	N/A	0.25	0.00	N/A
AVERAGE	11.9	987	10.0	0.20	0.00	N/A	0.31	0.00	N/A	0.37	0.00	N/A

DATE:

9/10/2009

WATER PLANT LABORATORY DATA - OZONE

TIME	INTAKE FLOW RATE (MGD)	O ₃ DOSAGES		OZONE RESIDUALS								
		O ₃ (lbs/day)	O ₃ (mg/L)	CHAMBER 1 Residual # 1 (mg/L)	CHAMBER 1 Residual # 2 (mg/L)	CHAMBER 1 Residual # 3 (mg/L)	CHAMBER 2 Residual # 4 (mg/L)	CHAMBER 2 Residual # 5 (mg/L)	CHAMBER 2 Residual # 6 (mg/L)	CHAMBER 3 Residual # 7 (mg/L)	CHAMBER 3 Residual # 8 (mg/L)	CHAMBER 3 Residual # (mg/L)
0:00	11.5	1001	10.4	0.27	0.00	N/A	0.23	0.00	N/A	0.29	0.00	N/A
1:00	11.7	998	10.2									
2:00	11.8	973	9.8									
3:00	11.8	1012	10.3	0.33	0.00	N/A	0.24	0.00	N/A	0.35	0.00	N/A
4:00	11.9	1027	10.4									
5:00	11.9	958	9.6									
6:00	11.8	994	10.1	0.21	0.00	N/A	0.26	0.00	N/A	0.33	0.00	N/A
7:00	11.6	983	10.1									
8:00	12.0	933	9.3									
9:00	11.8	974	9.9	0.38	0.00	N/A	0.46	0.00	N/A	0.43	0.00	N/A
10:00	11.8	941	9.5									
11:00	11.7	920	9.4									
12:00	11.7	933	9.5	0.31	0.00	N/A	0.27	0.00	N/A	0.50	0.00	N/A
13:00	12.1	964	9.5									
14:00	12.5	957	9.2									
15:00	11.8	968	9.8	0.14	0.00	N/A	0.00	N/A	N/A	0.40	0.00	N/A
16:00	11.7	995	10.2									
17:00	12.5	985	9.5									
18:00	13.7	1004	8.8	0.10	0.00	N/A	0.10	0.00	N/A	0.01	0.00	N/A
19:00	13.2	956	8.7									
20:00	13.6	1034	9.1									
21:00	13.5	951	8.4									
22:00	13.8	953	8.3									
23:00	13.3	1017	9.2									

MAXIMUM	13.8	1034	10.4	0.38	0.00	N/A	0.46	0.00	N/A	0.50	0.00	N/A
MINIMUM	11.5	920	8.3	0.10	0.00	N/A	0.00	0.00	N/A	0.01	0.00	N/A
AVERAGE	12.3	976	9.6	0.25	0.00	N/A	0.22	0.00	N/A	0.33	0.00	N/A

DATE:

9/11/2009

WATER PLANT LABORATORY DATA - OZONE

TIME	INTAKE FLOW RATE (MGD)	O ₃ DOSAGES		OZONE RESIDUALS								
		O ₃ (lbs/day)	O ₃ (mg/L)	CHAMBER 1 Residual # 1 (mg/L)	CHAMBER 1 Residual # 2 (mg/L)	CHAMBER 1 Residual # 3 (mg/L)	CHAMBER 2 Residual # 4 (mg/L)	CHAMBER 2 Residual # 5 (mg/L)	CHAMBER 2 Residual # 6 (mg/L)	CHAMBER 3 Residual # 7 (mg/L)	CHAMBER 3 Residual # 8 (mg/L)	CHAMBER 3 Residual # (mg/L)
0:00	13.8	977	8.5	0.09	0.00	N/A	0.11	0.00	N/A	0.09	0.00	N/A
1:00	13.6	996	8.8									
2:00	13.3	930	8.4									
3:00	13.6	934	8.2	0.19	0.00	N/A	0.44	0.00	N/A	0.31	0.00	N/A
4:00	11.9	941	9.5									
5:00	11.8	983	10.0									
6:00	11.5	1000	10.4	0.59	0.00	N/A	0.30	0.00	N/A	0.42	0.00	N/A
7:00	11.1	956	10.3									
8:00	11.2	993	10.6									
9:00	13.3	982	8.8	0.02	0.00	N/A	0.09	0.00	N/A	0.11	0.00	N/A
10:00	13.2	977	8.9									
11:00	13.3	950	8.6									
12:00	13.2	951	8.6	0.12	0.00	N/A	0.05	0.00	N/A	0.02	0.00	N/A
13:00	15.1	964	7.6									
14:00	15.3	907	7.1									
15:00	6.9	999	17.3	0.01	N/A	N/A	0.12	0.00	N/A	0.14	0.00	N/A
16:00	15.2	991	7.8									
17:00	15.2	964	7.6									
18:00	15.1	970	7.7	0.02	N/A	N/A	0.30	0.00	N/A	0.49	0.00	N/A
19:00	15.0	971	7.8									
20:00	15.1	958	7.6									
21:00	14.9	968	7.8	0.13	0.00	NA	0.00	N/A	N/A	0.19	0.00	N/A
22:00	15.0	953	7.6									
23:00	7.4	970	15.8									

MAXIMUM	15.3	1000	17.3	0.59	0.00	N/A	0.44	0.00	N/A	0.49	0.00	N/A
MINIMUM	6.9	907	7.1	0.01	0.00	N/A	0.00	0.00	N/A	0.02	0.00	N/A
AVERAGE	13.1	966	9.2	0.15	0.00	N/A	0.18	0.00	N/A	0.22	0.00	N/A

DATE:

9/12/2009

WATER PLANT LABORATORY DATA - OZONE

TIME	INTAKE FLOW RATE (MGD)	O ₃ DOSAGES		OZONE RESIDUALS								
		O ₃ (lbs/day)	O ₃ (mg/L)	CHAMBER 1 Residual # 1 (mg/L)	CHAMBER 1 Residual # 2 (mg/L)	CHAMBER 1 Residual # 3 (mg/L)	CHAMBER 2 Residual # 4 (mg/L)	CHAMBER 2 Residual # 5 (mg/L)	CHAMBER 2 Residual # 6 (mg/L)	CHAMBER 3 Residual # 7 (mg/L)	CHAMBER 3 Residual # 8 (mg/L)	CHAMBER 3 Residual # (mg/L)
0:00	15.1	969	7.7	0.01	N/A	N/A	0.00	N/A	N/A	0.17	N/A	N/A
1:00	15.9	1001	7.6									
2:00	13.3	976	8.8									
3:00	15.7	966	7.4	0.04	N/A	N/A	0.00	N/A	N/A	0.13	N/A	N/A
4:00	14.8	955	7.7									
5:00	15.2	984	7.8									
6:00	15.0	974	7.8	0.01	N/A	N/A	0.00	N/A	N/A	0.11	N/A	N/A
7:00	15.7	957	7.3									
8:00	16.3	954	7.0									
9:00	16.4	945	6.9	0.22	0.00	N/A	0.17	0.00	N/A	0.28	0.00	N/A
10:00	16.3	978	7.2									
11:00	16.2	970	7.2									
12:00	16.3	979	7.2	0.23	0.00	N/A	0.15	0.00	N/A	0.09	0.00	N/A
13:00	16.1	967	7.2									
14:00	16.3	980	7.2									
15:00	16.0	963	7.2	0.08	0.00	N/A	0.03	0.00	N/A	0.41	0.00	N/A
16:00	9.9	959	11.7									
17:00	11.3	967	10.3									
18:00	9.8	962	11.8	0.06	0.00	N/A	0.17	0.00	N/A	0.20	0.00	N/A
19:00	16.0	977	7.3									
20:00	16.1	959	7.1									
21:00	N.R.	N.R.	N/A	0.28	0.00	N/A	0.31	0.00	N/A	0.35	0.00	N/A
22:00	N.R.	N.R.	N/A									
23:00	N.R.	N.R.	N/A									

MAXIMUM	16.4	1001	11.83	0.28	0.00	N/A	0.31	0.00	N/A	0.41	0.00	N/A
MINIMUM	9.8	945	6.91	0.01	0.00	N/A	0.00	0.00	N/A	0.09	0.00	N/A
AVERAGE	14.9	969	7.97	0.12	0.00	N/A	0.10	0.00	N/A	0.22	0.00	N/A

DATE:

9/13/2009

WATER PLANT LABORATORY DATA - OZONE

TIME	INTAKE FLOW RATE (MGD)	O ₃ DOSAGES		OZONE RESIDUALS								
		O ₃ (lbs/day)	O ₃ (mg/L)	CHAMBER 1 Residual # 1 (mg/L)	CHAMBER 1 Residual # 2 (mg/L)	CHAMBER 1 Residual # 3 (mg/L)	CHAMBER 2 Residual # 4 (mg/L)	CHAMBER 2 Residual # 5 (mg/L)	CHAMBER 2 Residual # 6 (mg/L)	CHAMBER 3 Residual # 7 (mg/L)	CHAMBER 3 Residual # 8 (mg/L)	CHAMBER 3 Residual # (mg/L)
0:00	11.7	947	9.7	0.71	0.02	0.00	0.58	0.00	N/A	0.79	0.01	0.00
1:00	11.8	954	9.7									
2:00	11.7	950	9.7									
3:00	11.6	976	10.1	0.56	0.00	N/A	0.67	0.00	N/A	0.81	0.00	N/A
4:00	11.6	976	10.1									
5:00	11.7	977	10.0									
6:00	15.4	971	7.6									
7:00	15.5	996	7.7									
8:00	15.6	1001	7.7									
9:00	N.R.	N.R.	N/A	0.43	0.00	N/A	0.31	0.00	N/A	0.54	0.00	N/A
MAXIMUM	15.6	1001	10.1	0.71	0.02	N/A	0.67	0.00	N/A	0.81	0.01	N/A
MINIMUM	11.6	947	7.6	0.43	0.00	N/A	0.31	0.00	N/A	0.54	0.00	N/A
AVERAGE	12.9	972	9.1	0.57	0.01	N/A	0.52	0.00	N/A	0.71	0.00	N/A

INDIVIDUAL FILTER DATA

(9/9/09)

TIME	FILTER # 7				FILTER # 8				FILTER # 9				FILTER # 10			
	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)
0:00								0.185				0.184				
1:00																
2:00																
3:00																
4:00				0.243				0.242				0.232				0.239
5:00																
6:00				0.268				0.276				0.271				0.279
7:00																
8:00																
9:00				0.293				0.296				0.279				0.289
10:00																
11:00	1170	1.7	0.197		1246	1.8	0.186		1384	2.0	0.189		1472	2.1	0.188	
12:00	1163	1.7	0.173	0.182	1244	1.8	0.158	0.173	1377	2.0	0.164	0.186	1462	2.1	0.159	0.198
13:00	1170	1.7	0.146		1231	1.8	0.136		1388	2.0	0.137		1483	2.1	0.137	
14:00	1169	1.7	0.103		1222	1.7	0.134		1372	2.0	0.130		1477	2.1	0.135	
15:00	1175	1.7	0.088	0.176	1251	1.8	0.083	0.113	1390	2.0	0.084	0.108	1484	2.1	0.084	0.149
16:00	1177	1.7	0.084		1254	1.8	0.073		1391	2.0	0.074		1488	2.1	0.075	
17:00	1165	1.7	0.069		1244	1.8	0.064		1394	2.0	0.065		1480	2.1	0.066	
18:00	1172	1.7	0.070	0.098	1247	1.8	0.060	0.092	1390	2.0	0.061	0.112	1445	2.1	0.062	0.136
19:00	1177	1.7	0.068		1254	1.8	0.058		1391	2.0	0.059		1458	2.1	0.060	
20:00	1175	1.7	0.067		1265	1.8	0.056		1397	2.0	0.058		1491	2.1	0.059	
21:00	1185	1.7	0.066	0.147	1270	1.8	0.055	0.108	1416	2.0	0.057	0.129	1492	2.1	0.058	0.132
22:00	1203	1.7	0.066		1283	1.8	0.055		1417	2.0	0.056		1519	2.2	0.057	
23:00	1206	1.7	0.065		1287	1.8	0.054		1430	2.0	0.056		1518	2.2	0.057	

# of SAMPLES	13	13	13	7	13	13	13	8	13	13	13	8	13	13	13	7
MAXIMUM	1206	1.7	0.197	0.293	1287	1.8	0.186	0.296	1430	2.0	0.189	0.279	1519	2.2	0.188	0.289
MINIMUM	1163	1.7	0.065	0.098	1222	1.7	0.054	0.092	1372	2.0	0.056	0.108	1445	2.1	0.057	0.132
AVERAGE	1177	1.7	0.097	0.201	1254	1.8	0.090	0.186	1395	2.0	0.092	0.188	1482	2.1	0.092	0.203

INDIVIDUAL FILTER DATA

(9/9/09)

TIME	FILTER # 11				FILTER # 12				COMBINED FILTER EFFLUENT # 1 (filters #7,9,&11)				COMBINED FILTER EFFLUENT # 2 (filters #8,10,&12)			
	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)
0:00								0.196	*Only applicable if water is distributed to residents, due to placement of sample tap.				*Only applicable if water is distributed to residents, due to placement of sample tap.			
1:00																
2:00																
3:00																
4:00				0.245				0.239								
5:00																
6:00				0.295				0.212								
7:00																
8:00																
9:00				0.293				0.292								
10:00																
11:00	1059	1.5	0.206		1419	2.0	0.193									
12:00	1061	1.5	0.174	0.195	1427	2.0	0.167	0.177								
13:00	1066	1.5	0.151		1432	2.0	0.140									
14:00	1073	1.5	0.148		1424	2.0	0.130									
15:00	1060	1.5	0.092	0.165	1436	2.1	0.086	0.191								
16:00	1066	1.5	0.081		1424	2.0	0.075									
17:00	1068	1.5	0.070		1434	2.0	0.065									
18:00	1065	1.5	0.065	0.127	1430	2.0	0.061	0.130								
19:00	1070	1.5	0.063		1428	2.0	0.059									
20:00	1074	1.5	0.062		1430	2.0	0.057									
21:00	1092	1.6	0.060	0.142	1452	2.1	0.056	0.134								
22:00	1099	1.6	0.060		1472	2.1	0.056									
23:00	1104	1.6	0.059		1470	2.1	0.055									

# of SAMPLES	13	13	13	7	13	13	13	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MAXIMUM	1104	1.6	0.206	0.295	1472	2.1	0.193	0.292	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MINIMUM	1059	1.5	0.059	0.127	1419	2.0	0.055	0.130	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AVERAGE	1074	1.5	0.099	0.209	1437	2.1	0.082	0.196	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

INDIVIDUAL FILTER DATA

(9/10/09)

TIME	FILTER #7				FILTER #8				FILTER #9				FILTER #10			
	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)
0:00	1276	1.8	0.064	0.080	1559	2.2	0.054	0.088	1556	2.2	0.055	0.082	1543	2.2	0.056	0.087
1:00	1271	1.8	0.064		1562	2.2	0.053		1543	2.2	0.055		1537	2.2	0.055	
2:00	1243	1.8	0.063		1492	2.1	0.053		1507	2.2	0.055		1446	2.1	0.055	
3:00	1228	1.8	0.063	0.074	1483	2.1	0.053	0.082	1599	2.3	0.054	0.079	1443	2.1	0.055	0.071
4:00	1217	1.7	0.062		1487	2.1	0.053		1434	2.0	0.054		1424	2.0	0.055	
5:00	1220	1.7	0.062		1488	2.1	0.052		1489	2.1	0.053		1421	2.0	0.054	
6:00	1210	1.7	0.061	0.081	1481	2.1	0.052	0.083	1498	2.1	0.053	0.074	1429	2.0	0.053	0.076
7:00	1212	1.7	0.061		1490	2.1	0.052		1492	2.1	0.053		1420	2.0	0.053	
8:00	1203	1.7	0.060		1491	2.1	0.051		1466	2.1	0.052		1416	2.0	0.053	
9:00	1201	1.7	0.060	0.088	1471	2.1	0.051	0.138	1465	2.1	0.052	0.118	1415	2.0	0.053	0.089
10:00	1212	1.7	0.060		1489	2.1	0.051		1491	2.1	0.052		1412	2.0	0.053	
11:00	1204	1.7	0.060		1468	2.1	0.050		1474	2.1	0.051		1423	2.0	0.053	
12:00	1488	2.1	0.060	0.168	1873	2.7	0.050	0.101	1833	2.6	0.051	0.129	1815	2.6	0.052	0.133
13:00	1473	2.1	0.060		1864	2.7	0.050		1827	2.6	0.051		1812	2.6	0.052	
14:00	1499	2.1	0.061		1591	2.3	0.051		1777	2.5	0.052		1759	2.5	0.052	
15:00	1507	2.2	0.063	0.120	1614	2.3	0.052	0.088	1785	2.6	0.053	0.079	1760	2.5	0.054	0.098
16:00	1417	2.0	0.061		1625	2.3	0.052		1811	2.6	0.054		1765	2.5	0.054	
17:00	1459	2.1	0.062		1614	2.3	0.053		1797	2.6	0.054		1776	2.5	0.055	
18:00	1539	2.2	0.063	0.083	1724	2.5	0.053	0.098	1926	2.8	0.054	0.079	1876	2.7	0.055	0.078
19:00	1575	2.3	0.063		1746	2.5	0.063		1980	2.8	0.055		1951	2.8	0.056	
20:00	1824	2.6	0.065		1919	2.7	0.056		2199	3.1	0.058		2007	2.9	0.059	
21:00	1953	2.8	0.069	0.089	2190	3.1	0.059	0.090	2158	3.1	0.061	0.089	2276	3.3	0.061	0.098
22:00	1859	2.7	0.070		2095	3.0	0.061		2265	3.2	0.063		2166	3.1	0.063	
23:00	1854	2.6	0.071		2116	3.0	0.061		2241	3.2	0.064		2176	3.1	0.064	

# of SAMPLES	24	24	24	8	24	24	24	8	24	24	24	8	24	24	24	8
MAXIMUM	1953	2.8	0.071	0.168	2190	3.1	0.063	0.136	2265	3.2	0.064	0.129	2276	3.3	0.064	0.133
MINIMUM	1201	1.7	0.060	0.074	1468	2.1	0.050	0.082	1434	2.0	0.051	0.074	1412	2.0	0.052	0.071
AVERAGE	1423	2.0	0.063	0.098	1664	2.4	0.054	0.096	1734	2.5	0.055	0.091	1686	2.4	0.055	0.091

INDIVIDUAL FILTER DATA

(9/10/09)

TIME	FILTER # 11				FILTER # 12				COMBINED FILTER EFFLUENT # 1 (filters #7,9,&11)				COMBINED FILTER EFFLUENT # 2 (filters #8,10,&12)			
	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)
0:00	1156	1.7	0.058	0.087	1601	2.3	0.055	0.091	*Only applicable if water is distributed to residents, due to placement of sample tap.	*Only applicable if water is distributed to residents, due to placement of sample tap.						
1:00	1172	1.7	0.058		1661	2.4	0.055									
2:00	1103	1.6	0.057		1540	2.2	0.054									
3:00	1094	1.6	0.057	0.077	1539	2.2	0.054	0.094								
4:00	1092	1.6	0.056		1521	2.2	0.054									
5:00	1091	1.6	0.056		1514	2.2	0.053									
6:00	1095	1.6	0.055	0.074	1519	2.2	0.053	0.086								
7:00	1096	1.6	0.055		1524	2.2	0.053									
8:00	1094	1.6	0.055		1503	2.1	0.052									
9:00	1095	1.6	0.055	0.105	1510	2.2	0.052	0.105								
10:00	1092	1.6	0.054		1519	2.2	0.051									
11:00	1040	1.5	0.054		1478	2.1	0.051									
12:00	1448	2.1	0.054	0.105	TAKEN OUT OF SERVICE. Due to a positive coliform sample (1 MPN), just prior to distributing water to residents				N.R.	N/A	N.R.		N.R.	N/A	N.R.	
13:00	1431	2.0	0.054						N.R.	N/A	N.R.		N.R.	N/A	N.R.	
14:00	1353	1.9	0.055						N.R.	N/A	N.R.	0.108	N.R.	N/A	N.R.	0.087
15:00	1342	1.9	0.055	0.079					N.R.	N/A	N.R.		N.R.	N/A	N.R.	
16:00	1373	2.0	0.055						N.R.	N/A	N.R.		N.R.	N/A	N.R.	
17:00	1364	1.9	0.056						N.R.	N/A	N.R.	0.083	N.R.	N/A	N.R.	0.087
18:00	1434	2.0	0.056	0.084					N.R.	N/A	N.R.		N.R.	N/A	N.R.	
19:00	1462	2.1	0.057						N.R.	N/A	N.R.		N.R.	N/A	N.R.	
20:00	1549	2.2	0.059						N.R.	N/A	N.R.		N.R.	N/A	N.R.	
21:00	1650	2.4	0.062	0.090					N.R.	N/A	N.R.	0.091	N.R.	N/A	N.R.	0.102
22:00	1584	2.3	0.063						N.R.	N/A	N.R.		N.R.	N/A	N.R.	
23:00	1593	2.3	0.064						N.R.	N/A	N.R.		N.R.	N/A	N.R.	

N.R. = Not recorded

N/A = Not applicable

# of SAMPLES	24	24	24	8	12	12	12	4	N/A	N/A	N/A	3	N/A	N/A	N/A	3
MAXIMUM	1650	2.4	0.064	0.105	1661	2.4	0.055	0.105	N/A	N/A	N/A	0.108	N/A	N/A	N/A	0.102
MINIMUM	1040	1.5	0.054	0.074	1478	2.1	0.051	0.086	N/A	N/A	N/A	0.083	N/A	N/A	N/A	0.087
AVERAGE	1283	1.8	0.057	0.088	1536	2.2	0.053	0.094	N/A	N/A	N/A	0.094	N/A	N/A	N/A	0.092

INDIVIDUAL FILTER DATA

(9/11/09)

TIME	FILTER # 7				FILTER # 8				FILTER # 9				FILTER # 10			
	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)
0:00	1801	2.6	0.072	0.082	2060	2.9	0.062	0.091	2193	3.1	0.065	0.094	2165	3.1	0.065	0.086
1:00	1772	2.5	0.073		1998	2.9	0.062		2145	3.1	0.065		2086	3.0	0.065	
2:00	1749	2.5	0.072		2002	2.9	0.062		2134	3.0	0.064		2060	2.9	0.064	
3:00	1748	2.5	0.072	0.079	2018	2.9	0.061	0.085	2111	3.0	0.064	0.081	2088	3.0	0.064	0.086
4:00	1547	2.2	0.069		1790	2.6	0.058		1898	2.7	0.061		1869	2.7	0.062	
5:00	1539	2.2	0.068		1803	2.6	0.058		1911	2.7	0.061		1856	2.7	0.061	
6:00	1442	2.1	0.064	0.110	1683	2.4	0.054	0.120	1705	2.4	0.057	0.149	1679	2.4	0.057	0.150
7:00	1454	2.1	0.063		1682	2.4	0.053		1761	2.5	0.054		1662	2.4	0.055	
8:00	1442	2.1	0.061		1677	2.4	0.052		1776	2.5	0.053		1671	2.4	0.055	
9:00	2420	3.5	0.059	0.082	2809	4.0	0.052	0.089	2768	4.0	0.053	0.083	2660	3.8	0.053	0.075
10:00	1484	2.1	0.060		2045	2.9	0.050		1788	2.6	0.051		1956	2.8	0.052	
11:00	1907	2.7	0.056		2175	3.1	0.047		2255	3.2	0.048		2090	3.0	0.049	
12:00	1654	2.4	0.057	0.072	1911	2.7	0.048	0.077	1970	2.8	0.048	0.082	1975	2.8	0.050	0.088
13:00	1629	2.3	0.057		1904	2.7	0.047		1969	2.8	0.049		1962	2.8	0.050	
14:00	1660	2.4	0.062		1904	2.7	0.052		1976	2.8	0.054		1873	2.7	0.055	
15:00	1720	2.5	0.064	0.112	2004	2.9	0.055	0.098	2066	3.0	0.056	0.121	1929	2.8	0.057	0.149
16:00	1662	2.4	0.070		1961	2.8	0.061		2011	2.9	0.062		1867	2.7	0.063	
17:00	1651	2.4	0.070		1968	2.8	0.061		1983	2.8	0.062		1878	2.7	0.063	
18:00	1642	2.3	0.070	0.149	1926	2.8	0.061	0.132	1974	2.8	0.062	0.136	1870	2.7	0.063	0.136
19:00	1638	2.3	0.072		1954	2.8	0.062		1957	2.8	0.063		1856	2.7	0.064	
20:00	1635	2.3	0.072		1928	2.8	0.063		1985	2.8	0.064		1868	2.7	0.065	
21:00	1625	2.3	0.075	0.141	1956	2.8	0.065	0.134	1959	2.8	0.066	0.131	1859	2.7	0.068	0.163
22:00	1622	2.3	0.076		1922	2.7	0.065		1974	2.8	0.067		1856	2.7	0.068	
23:00	1616	2.3	0.075		1937	2.8	0.065		1956	2.8	0.067		1875	2.7	0.068	

# of SAMPLES	24	24	24	8	24	24	24	8	24	24	24	8	24	24	24	8
MAXIMUM	2420	3.5	0.076	0.149	2809	4.0	0.065	0.134	2768	4.0	0.067	0.149	2660	3.8	0.068	0.163
MINIMUM	1442	2.1	0.056	0.072	1677	2.4	0.047	0.077	1705	2.4	0.048	0.081	1662	2.4	0.049	0.075
AVERAGE	1669	2.4	0.067	0.103	1959	2.8	0.057	0.103	2009	2.9	0.059	0.110	1938	2.8	0.060	0.117

INDIVIDUAL FILTER DATA

(9/11/09)

TIME	FILTER # 11				FILTER # 12				COMBINED FILTER EFFLUENT # 1 (filters #7,9,&11)				COMBINED FILTER EFFLUENT # 2 (filters #8,10,&12)			
	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)
0:00	1551	2.2	0.066	0.093	TAKEN OUT OF SERVICE. Due to a positive coliform sample (1 MPN), just prior to distributing water to residents. Put back in service after consecutive clear samples.				N.R.	N/A	N.R.	0.090	N.R.	N/A	N.R.	0.097
1:00	1536	2.2	0.067						N.R.	N/A	N.R.		N.R.	N/A	N.R.	
2:00	1522	2.2	0.067						N.R.	N/A	N.R.		N.R.	N/A	N.R.	
3:00	1530	2.2	0.066	0.084					N.R.	N/A	N.R.	0.080	N.R.	N/A	N.R.	0.083
4:00	1375	2.0	0.063						N.R.	N/A	N.R.		N.R.	N/A	N.R.	
5:00	1395	2.0	0.062						N.R.	N/A	N.R.		N.R.	N/A	N.R.	
6:00	1163	1.7	0.059	0.085					N.R.	N/A	N.R.	0.135	N.R.	N/A	N.R.	0.132
7:00	1264	1.8	0.057						N.R.	N/A	N.R.		N.R.	N/A	N.R.	
8:00	1273	1.8	0.056						N.R.	N/A	N.R.		N.R.	N/A	N.R.	
9:00	1956	2.8	0.059	0.082					N.R.	N/A	N.R.	0.129	N.R.	N/A	N.R.	0.079
10:00	1919	2.7	0.055		2010	2.9	0.090		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
11:00	1725	2.5	0.051		2233	3.2	0.053		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
12:00	1454	2.1	0.051	0.078	1924	2.7	0.052	0.080	N.R.	N/A	N.R.	0.074	N.R.	N/A	N.R.	0.072
13:00	1439	2.1	0.051		1921	2.7	0.052		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
14:00	1455	2.1	0.056		1931	2.8	0.057		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
15:00	1550	2.2	0.058	0.157	2056	2.9	0.060	0.150	N.R.	N/A	N.R.	0.113	N.R.	N/A	N.R.	0.135
16:00	1524	2.2	0.065		2015	2.9	0.068		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
17:00	1509	2.2	0.065		2020	2.9	0.068		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
18:00	1513	2.2	0.065	0.161	1996	2.9	0.069	0.166	N.R.	N/A	N.R.	0.127	N.R.	N/A	N.R.	0.133
19:00	1492	2.1	0.066		2056	2.9	0.070		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
20:00	1554	2.2	0.067		1994	2.8	0.070		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
21:00	1504	2.1	0.070	0.128	2012	2.9	0.074	0.132	N.R.	N/A	N.R.	0.135	N.R.	N/A	N.R.	0.136
22:00	1519	2.2	0.070		2020	2.9	0.074		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
23:00	1514	2.2	0.071		2006	2.9	0.074		N.R.	N/A	N.R.		N.R.	N/A	N.R.	

N.R. = Not recorded

N/A = Not applicable

# of SAMPLES	24	24	24	8	14	14	14	4	N/A	N/A	N/A	8	N/A	N/A	N/A	8
MAXIMUM	1956	2.8	0.071	0.161	2233	3.2	0.090	0.166	N/A	N/A	N/A	0.135	N/A	N/A	N/A	0.136
MINIMUM	1163	1.7	0.051	0.078	1921	2.7	0.052	0.080	N/A	N/A	N/A	0.074	N/A	N/A	N/A	0.072
AVERAGE	1510	2.2	0.062	0.109	2014	2.9	0.067	0.132	N/A	N/A	N/A	0.110	N/A	N/A	N/A	0.108

INDIVIDUAL FILTER DATA

(9/12/09)

TIME	FILTER # 7				FILTER # 8				FILTER # 9				FILTER # 10			
	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)
0:00	1636	2.3	0.075	0.087	1950	2.8	0.064	0.099	1963	2.8	0.066	0.091	1871	2.7	0.067	0.117
1:00	1626	2.3	0.075		1942	2.8	0.065		1998	2.9	0.066		1862	2.7	0.067	
2:00	1619	2.3	0.074		1924	2.7	0.064		1966	2.8	0.066		1869	2.7	0.066	
3:00	1651	2.4	0.074	0.085	1973	2.8	0.064	0.110	2004	2.9	0.065	0.101	1898	2.7	0.066	0.089
4:00	1661	2.4	0.074		1986	2.8	0.063		1992	2.8	0.065		1908	2.7	0.066	
5:00	1654	2.4	0.074		1992	2.8	0.063		1998	2.9	0.065		1994	2.8	0.066	
6:00	1648	2.4	0.071	0.142	1984	2.8	0.060	0.142	1999	2.9	0.061	0.156	1887	2.7	0.063	0.123
7:00	1621	2.3	0.068		1940	2.8	0.057		1955	2.8	0.058		1875	2.7	0.060	
8:00	1604	2.3	0.066		1951	2.8	0.055		1909	2.7	0.057		1829	2.6	0.058	
9:00	1566	2.2	0.065	0.082	1865	2.7	0.053	0.086	1891	2.7	0.054	0.081	1805	2.6	0.055	0.095
10:00	1526	2.2	0.062		1853	2.6	0.050		1853	2.6	0.052		1784	2.5	0.053	
11:00	1509	2.2	0.059		1839	2.6	0.049		1801	2.6	0.050		1775	2.5	0.051	
12:00	1529	2.2	0.060	0.079	1840	2.6	0.048	0.076	1825	2.6	0.049	0.074	1781	2.5	0.050	0.078
13:00	1513	2.2	0.060		1842	2.6	0.048		1814	2.6	0.048		1773	2.5	0.050	
14:00	1502	2.1	0.058		1860	2.7	0.046		1839	2.6	0.046		1796	2.6	0.048	
15:00	1514	2.2	0.058	0.161	1839	2.6	0.045	0.169	1809	2.6	0.046	0.131	1765	2.5	0.048	0.117
16:00	1485	2.1	0.057		1802	2.6	0.046		1798	2.6	0.046		1758	2.5	0.048	
17:00	1492	2.1	0.057		1807	2.6	0.046		1805	2.6	0.047		1733	2.5	0.048	
18:00	1476	2.1	0.057	0.118	1811	2.6	0.045	0.161	1794	2.6	0.045	0.140	1749	2.5	0.047	0.114
19:00	1469	2.1	0.057		1797	2.6	0.045		1807	2.6	0.045		1445	2.1	0.048	
20:00	1464	2.1	0.056		1781	2.5	0.045		1756	2.5	0.048		1640	2.3	0.048	
21:00	1460	2.1	0.056	0.144	1811	2.6	0.045	0.165	1792	2.6	0.046	0.186	1746	2.5	0.048	0.110
22:00	N.R.	N/A	N.R.		N.R.	N/A	N.R.		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
23:00	1506	2.2	0.056		1834	2.6	0.045		1813	2.6	0.046		1752	2.5	0.048	

N.R. = Not recorded

N/A = Not applicable

# of SAMPLES	23	23	23	8	23	23	23	8	23	23	23	8	23	23	23	8
MAXIMUM	1661	2.4	0.075	0.187	1992	2.8	0.065	0.169	2004	2.9	0.066	0.186	1994	2.9	0.067	0.123
MINIMUM	1460	2.1	0.056	0.079	1781	2.5	0.045	0.076	1756	2.5	0.045	0.074	1445	2.1	0.047	0.078
AVERAGE	1554	2.2	0.064	0.112	1879	2.7	0.053	0.126	1877	2.7	0.054	0.120	1795	2.6	0.055	0.105

INDIVIDUAL FILTER DATA

(9/12/09)

TIME	FILTER # 11				FILTER # 12				COMBINED FILTER EFFLUENT # 1 (filters #7,9,&11)				COMBINED FILTER EFFLUENT # 2 (filters #8,10,&12)			
	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)
0:00	1511	2.2	0.070	0.099	1996	2.9	0.073	0.100	N.R.	N/A	N.R.	0.090	N.R.	N/A	N.R.	0.094
1:00	1519	2.2	0.070		2001	2.9	0.073		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
2:00	1511	2.2	0.069		2006	2.9	0.072		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
3:00	1539	2.2	0.069	0.098	2048	2.9	0.072	0.101	N.R.	N/A	N.R.	0.103	N.R.	N/A	N.R.	0.089
4:00	1537	2.2	0.069		2052	2.9	0.072		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
5:00	1544	2.2	0.068		2046	2.9	0.071		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
6:00	1537	2.2	0.065	0.097	2031	2.9	0.067	0.094	N.R.	N/A	N.R.	0.091	N.R.	N/A	N.R.	0.099
7:00	1527	2.2	0.062		1999	2.9	0.064		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
8:00	1499	2.1	0.060		1999	2.9	0.061		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
9:00	1472	2.1	0.057	0.097	1944	2.8	0.059	0.091	N.R.	N/A	N.R.	0.072	N.R.	N/A	N.R.	0.078
10:00	1450	2.1	0.055		1916	2.7	0.057		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
11:00	1444	2.1	0.053		1896	2.7	0.055		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
12:00	1455	2.1	0.052	0.083	1915	2.7	0.053	0.084	N.R.	N/A	N.R.	0.085	N.R.	N/A	N.R.	0.088
13:00	1439	2.1	0.051		1914	2.7	0.051		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
14:00	1454	2.1	0.050		1925	2.8	0.051		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
15:00	1446	2.1	0.049	0.112	1899	2.7	0.050	0.088	N.R.	N/A	N.R.	0.106	N.R.	N/A	N.R.	0.097
16:00	1431	2.0	0.049		1896	2.7	0.050		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
17:00	1436	2.1	0.050		1899	2.7	0.050		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
18:00	1441	2.1	0.049	0.087	1881	2.7	0.049	0.174	N.R.	N/A	N.R.	0.147	N.R.	N/A	N.R.	0.131
19:00	1433	2.0	0.049		1892	2.7	0.049		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
20:00	1436	2.1	0.049		1801	2.6	0.050		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
21:00	1428	2.0	0.049	0.105	1875	2.7	0.050	0.139	N.R.	N/A	N.R.	0.124	N.R.	N/A	N.R.	0.112
22:00	N.R.	N/A	N.R.		N.R.	N/A	N.R.		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
23:00	1459	2.1	0.049		1922	2.7	0.050		N.R.	N/A	N.R.		N.R.	N/A	N.R.	

N.R. = Not recorded

N/A = Not applicable

# of SAMPLES	23	23	23	8	23	23	23	8	N/A	N/A	N/A	8	N/A	N/A	N/A	8
MAXIMUM	1544	2.2	0.070	0.112	2052	2.9	0.073	0.174	N/A	N/A	N/A	0.147	N/A	N/A	N/A	0.131
MINIMUM	1428	2.0	0.049	0.083	1801	2.6	0.049	0.084	N/A	N/A	N/A	0.072	N/A	N/A	N/A	0.078
AVERAGE	1476	2.1	0.057	0.097	1946	2.8	0.059	0.109	N/A	N/A	N/A	0.102	N/A	N/A	N/A	0.099

INDIVIDUAL FILTER DATA

(9/13/09)

TIME	FILTER # 7				FILTER # 8				FILTER # 9				FILTER # 10			
	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)
0:00	1326	1.9	0.059	0.064	1656	2.4	0.045	0.073	1600	2.3	0.047	0.082	1596	2.3	0.049	0.077
1:00	1197	1.7	0.062		1510	2.2	0.044		1468	2.1	0.048		1460	2.1	0.049	
2:00	1001	1.4	0.063		1228	1.8	0.044		1182	1.7	0.046		1241	1.8	0.050	
3:00	991	1.4	0.069	0.065	1237	1.8	0.043	0.065	1179	1.7	0.044	0.065	1232	1.8	0.046	0.073
4:00	996	1.4	0.073		1259	1.8	0.042		1196	1.7	0.044		1254	1.8	0.046	
5:00	1009	1.4	0.077		1252	1.8	0.041		1193	1.7	0.043		1255	1.8	0.044	
6:00	1112	1.6	0.071		1393	2.0	0.040		1335	1.9	0.042		1379	2.0	0.044	
7:00	1493	2.1	0.051		1886	2.7	0.034		1815	2.6	0.036		1789	2.6	0.038	
8:00	1486	2.1	0.048		1805	2.6	0.032		1796	2.6	0.033		1777	2.5	0.036	
9:00				0.078				0.068				0.149				0.130
10:00																
11:00																
12:00																

# of SAMPLES	9	9	9	3	9	9	9	3	9	9	9	3	9	9	9	3
MAXIMUM	1493	2.1	0.077	0.078	1886	2.7	0.045	0.073	1815	2.6	0.048	0.149	1789	2.6	0.050	0.130
MINIMUM	991	1.4	0.048	0.064	1228	1.8	0.032	0.065	1179	1.7	0.033	0.065	1232	1.8	0.036	0.073
AVERAGE	1179	1.7	0.064	0.069	1470	2.1	0.041	0.069	1418	2.0	0.043	0.099	1443	2.1	0.045	0.093

INDIVIDUAL FILTER DATA

(9/13/09)

TIME	FILTER # 11				FILTER # 12				COMBINED FILTER EFFLUENT # 1 (filters #7,9,&11)				COMBINED FILTER EFFLUENT # 2 (filters #8,10,&12)			
	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)	FLOW (GPM)	FILTRATION RATE (GPM/sq.ft)	INLINE TURBIDITY (NTU)	LAB TURBIDITY (NTU)
0:00	1316	1.9	0.049	0.070	1722	2.5	0.054	0.068	N.R.	N/A	N.R.	0.078	N.R.	N/A	N.R.	0.087
1:00	1218	1.7	0.050		1601	2.3	0.053		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
2:00	920	1.3	0.049		1216	1.7	0.056		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
3:00	936	1.3	0.047	0.093	1220	1.8	0.055	0.080	N.R.	N/A	N.R.	0.084	N.R.	N/A	N.R.	0.079
4:00	932	1.3	0.046		1241	1.8	0.056		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
5:00	934	1.3	0.046		1245	1.8	0.056		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
6:00	1026	1.5	0.046		1352	1.9	0.056		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
7:00	1483	2.1	0.040		1921	2.7	0.042		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
8:00	1466	2.1	0.036		1916	2.7	0.036		N.R.	N/A	N.R.		N.R.	N/A	N.R.	
9:00				0.060				0.073	N.R.	N/A	N.R.	0.119	N.R.	N/A	N.R.	0.076
10:00									N.R.	N/A	N.R.		N.R.	N/A	N.R.	
11:00									N.R.	N/A	N.R.		N.R.	N/A	N.R.	
12:00									N.R.	N/A	N.R.		N.R.	N/A	N.R.	

N.R. = Not recorded

N/A = Not applicable

# of SAMPLES	9	9	9	3	9	9	9	3	N/A	N/A	N/A	3	N/A	N/A	N/A	3
MAXIMUM	1483	2.1	0.050	0.093	1921	2.7	0.056	0.080	N/A	N/A	N/A	0.119	N/A	N/A	N/A	0.087
MINIMUM	920	1.3	0.036	0.060	1216	1.7	0.036	0.068	N/A	N/A	N/A	0.078	N/A	N/A	N/A	0.076
AVERAGE	1137	1.6	0.045	0.074	1494	2.1	0.052	0.074	N/A	N/A	N/A	0.094	N/A	N/A	N/A	0.081

BAD TURB

needs to
be replaced

BAD TURB

MICROBIOLOGICAL DATA

DATE	TIME	SOURCE WATER (River Intake)			POST OZONE			PLATE SETTLER EFFLUENT		
		TOTAL COLIFORMS	FECAL COLIFORMS/ E.Coli	HPC	TOTAL COLIFORMS	FECAL COLIFORMS/ E.Coli	HPC	TOTAL COLIFORMS	FECAL COLIFORMS/ E.Coli	HPC
9/8/2009	12:00	1374.0	30.0	1080.0	461.1	1.0	287.0	3.0	< 1	40.0
	15:00	1722.0	26.0	970.0	224.7	< 1	372.0	< 1	< 1	10.0
	18:00	1664.0	62.0		143.9	< 1		< 1	< 1	
	21:00	2247.0	41.0		145.0	< 1		< 1	< 1	
9/9/2009	0:00	2014.0	134.0		105.0	< 1		< 1	< 1	
	3:00	1935.0	74.0		95.0	< 1		< 1	< 1	
	6:00	2187.0	110.0	1610.0	104.6	1.0	311.0	< 1	< 1	6.0
	9:00	3076.0	180.0		81.3	< 1		< 1	< 1	
	12:00	2613.0	146.0	2870.0	90.8	< 1	>738	< 1	< 1	6.0
	15:00	2143.0	189.0		249.9	2.0		< 1	< 1	
	18:00	1989.0	74.0	1460.0	275.5	< 1	372.0	< 1	< 1	2.0
	21:00	1860.0	109.0		198.2	< 1		< 1	< 1	
9/10/2009	0:00	2282.0	110.0	2750.0	248.1	2.0	311.0	< 1	< 1	40.0
	3:00	2481.0	97.0		275.5	4.1		< 1	< 1	
	6:00	2247.0	75.0		488.4	2.0		< 1	< 1	
	9:00	2282.0	41.0	2870.0	204.6	< 1	>738	< 1	< 1	6.0
	12:00	2359.0	96.0		547.5	5.2		< 1	< 1	
	15:00	2247.0	84.0		517.2	13.6		< 1	< 1	
	18:00	2700.0	41.0	2160.0	1986.3	25.9	440.0	< 1	< 1	17.0
	21:00	2282.0	122.0		517.2	4.1		< 1	< 1	
9/11/2009	0:00	1500.0	< 1		387.3	6.3		< 1	< 1	
	3:00	1539.0	63.0	1680.0	1732.9	7.5	372.0	< 1	< 1	17.0
	6:00	1187.0	20.0		251.3	4.1		< 1	< 1	
	9:00	1524.0	32.0		816.4	3.1		< 1	< 1	
	12:00	2909.0	74.0	1830.0	770.1	1.0	440.0	< 1	< 1	59.0
	15:00	1723.0	41.0	1150.0	1203.3	3.0	>738	< 1	< 1	37.0
	18:00	1333.0	52.0		920.8	5.2		< 1	< 1	
	21:00	2613.0	53.0		770.1	4.1		44.8	< 1	
9/12/2009	0:00	1553.0	86.0	3240.0	365.4	1.0	>738	< 1	< 1	62.0
	3:00	771.0	20.0		260.3	1.0		< 1	< 1	
	6:00	1314.0	75.0		204.6	1.0		1.0	< 1	
	9:00	Present	Present		Present	Absent		Absent	Absent	
	12:00	959.0	10.0	1160.0	307.6	< 1	>738	< 1	< 1	17.0
	15:00	Present	Present	1370.0	Present	Absent	470.0	Absent	Absent	2.0
	18:00	N/A	N/A		686.7	< 1		< 1	< 1	
	21:00	Present	Present		Present	Absent		Present	Absent	
9/13/2009	0:00	272.0	< 1		261.3	< 1		< 1	< 1	
	3:00	464.0	10.0		179.3	1.0		< 1	< 1	
	9:00	1860.0	< 1	2990.0	272.3	< 1	738.0	> 2419.6	< 1	623.0
# of SAMPLES		38	38	15	39	39	15	39	39	15
MAXIMUM		3076.0	189.0	3240.0	1986.3	25.9	> 738	44.8	< 1	623.0
MINIMUM		272.0	< 1	970.0	81.3	< 1	287.0	< 1	< 1	2.0

MICROBIOLOGICAL DATA

DATE	TIME	CONTACT CLARIFIER EFFLUENT (Filter Influent)			FILTER # 7			FILTER # 8			FILTER # 9		
		TOTAL COLIFORMS	FECAL COLIFORMS/ E.Coli	HPC	TOTAL COLIFORMS	FECAL COLIFORMS/ E.Coli	HPC	TOTAL COLIFORMS	FECAL COLIFORMS/ E.Coli	HPC	TOTAL COLIFORMS	FECAL COLIFORMS/ E.Coli	HPC
9/8/2009	12:00	18.7	< 1	299.0									
	15:00	2.0	< 1	4.0									
	18:00	< 1	< 1										
	21:00	< 1	< 1								< 1	< 1	
9/9/2009	0:00	< 1	< 1					< 1	< 1		< 1	< 1	
	3:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	6:00	< 1	< 1	56.0	< 1	< 1	71	< 1	< 1	59	< 1	< 1	30
	9:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	12:00	< 1	< 1	86.0	< 1	< 1	124	< 1	< 1	195	< 1	< 1	43
	15:00	1.0	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	18:00	< 1	< 1	6.0	< 1	< 1	195	< 1	< 1	299	< 1	< 1	62
9/10/2009	21:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	0:00	< 1	< 1	26.0	< 1	< 1	48	< 1	< 1	128	< 1	< 1	33
	3:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	6:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	9:00	< 1	< 1	4.0	< 1	< 1	71	< 1	< 1	108	< 1	< 1	45
	12:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	15:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
9/11/2009	18:00	< 1	< 1	< 2	< 1	< 1	< 2	< 1	< 1	6	< 1	< 1	< 2
	21:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	0:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	3:00	< 1	< 1	239.0	< 1	< 1	12	< 1	< 1	35	< 1	< 1	23
	6:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	9:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	12:00	< 1	< 1	311.0	< 1	< 1	26	< 1	< 1	56	< 1	< 1	19
9/12/2009	15:00	< 1	< 1	161.0	< 1	< 1	26	2	< 1	48	< 1	< 1	19
	18:00	< 1	< 1		3.1	< 1		3.1	< 1		2	< 1	
	21:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	0:00	< 1	< 1	216.0	< 1	< 1	21	< 1	< 1	23	< 1	< 1	21
	3:00	< 1	< 1		< 1	< 1		< 1	< 1		< 1	< 1	
	6:00	< 1	< 1		2	< 1		3.1	< 1		2	< 1	
	9:00	Absent	Absent		Present	Absent		Present	Absent		Present	Absent	
9/13/2009	12:00	< 1	< 1	74.0	5.2	< 1	171	8.5	< 1	195	9.8	< 1	59
	15:00	Absent	Absent	15.0	Present	Absent	104	Present	Absent	100	Present	Absent	53
	18:00	< 1	< 1		21.3	< 1		26.2	< 1		17.5	< 1	
	21:00	Absent	Absent		Present	Absent		Present	Absent		Present	Absent	
	0:00	< 1	< 1		38.4	< 1		32.7	< 1		47.1	< 1	
9/13/2009	3:00	< 1	< 1		Present	Absent		Present	Absent		Present	Absent	
	9:00	> 2419.6	1.0	339.0	> 2419.6	< 1	68	> 2419.6	< 1	216	> 2419.6	< 1	120

# of SAMPLES	39	39	15	34	34	13	35	35	13	36	36	13
MAXIMUM	> 2419.6	1.0	339.0	> 2419.6	< 1	195.0	> 2419.6	< 1	299.0	> 2419.6	< 1	120.0
MINIMUM	< 1	< 1	< 2	1.0	< 1	12.0	< 1	< 1	6.0	< 1	< 1	19.0

MICROBIOLOGICAL DATA

DATE	TIME	FILTER # 10			FILTER # 11			FILTER # 12		
		TOTAL COLIFORMS	FECAL COLIFORMS/E. coli	HPC	TOTAL COLIFORMS	FECAL COLIFORMS/E. coli	HPC	TOTAL COLIFORMS	FECAL COLIFORMS/E. coli	HPC
9/8/2009	12:00									
	15:00									
	18:00									
	21:00							< 1	< 1	
9/9/2009	0:00							< 1	< 1	
	3:00	< 1	< 1		< 1	< 1		< 1	< 1	
	6:00	< 1	< 1	48	< 1	< 1	53.0	< 1	< 1	23.0
	9:00	< 1	< 1		< 1	< 1		1.0	< 1	
	12:00	< 1	< 1	51	< 1	< 1	186.0	1.0	< 1	26.0
	15:00	< 1	< 1		1.0	< 1		< 1	< 1	
	18:00	< 1	< 1	51	< 1	< 1	120.0	< 1	< 1	56.0
	21:00	< 1	< 1		< 1	< 1		< 1	< 1	
9/10/2009	0:00	< 1	< 1	23	< 1	< 1	51.0	< 1	< 1	8.0
	3:00	< 1	< 1		< 1	< 1		< 1	< 1	
	6:00	< 1	< 1		< 1	< 1		< 1	< 1	
	9:00	< 1	< 1	26	< 1	< 1	53.0	< 1	< 1	15.0
	12:00	< 1	< 1		< 1	< 1		Out of Service		
	15:00	< 1	< 1		< 1	< 1				
	18:00	< 1	< 1	4	< 1	< 1	4.0			
	21:00	< 1	< 1		< 1	< 1				
9/11/2009	0:00	< 1	< 1		< 1	< 1				
	3:00	< 1	< 1	19	< 1	< 1	8.0			
	6:00	< 1	< 1		< 1	< 1				
	9:00	< 1	< 1		< 1	< 1				
	12:00	< 1	< 1	56	< 1	< 1	26.0	1.0	< 1	137.0
	15:00	< 1	< 1	62	1.0	< 1	38.0	3.1	< 1	77.0
	18:00	< 1	< 1		3.1	< 1		2.0	< 1	
	21:00	< 1	< 1		< 1	< 1		< 1	< 1	
9/12/2009	0:00	< 1	< 1	90	< 1	< 1	19.0	< 1	< 1	339.0
	3:00	< 1	< 1		< 1	< 1		< 1	< 1	
	6:00	1	< 1		3.1	< 1		1.0	< 1	
	9:00	Present	Absent		Present	Absent		Present	Absent	
	12:00	6.2	< 1	392	4.1	< 1	141.0	5.1	< 1	> 738
	15:00	Present	Absent	128	Present	Absent	177.0	Present	Absent	> 738
	18:00	24.1	< 1		19.9	< 1		17.3	< 1	
	21:00	Present	Absent		Present	Absent		Present	Absent	
9/13/2009	0:00	36.9	< 1		35.9	< 1		62.4	< 1	
	3:00	Present	Absent		Present	Absent		Present	Absent	
	9:00	> 2419.6	< 1	183	1986.3	< 1	116.0	> 2419.6	< 1	151.0
# of SAMPLES		34	34	13	34	34	13	28	28	11
MAXIMUM		> 2419.6	< 1	392.0	1986.3	< 1	177.0	> 2419.6	< 1	> 738
MINIMUM		< 1	< 1	4.0	< 1	< 1	4.0	< 1	< 1	8.0

MICROBIOLOGICAL DATA

DATE	TIME	COMBINED FILTER EFFLUENT # 1 (filters #7,9,&11)			COMBINED FILTER EFFLUENT # 2 (filters #8,10,&12)		
		TOTAL COLIFORMS	FECAL COLIFORMS/E.Coli	HPC	TOTAL COLIFORMS	FECAL COLIFORMS/E.Coli	HPC
9/8/2009	12:00	*Only applicable if water is distributed to residents, due to placement of sample tap.			*Only applicable if water is distributed to residents, due to placement of sample tap.		
	15:00						
	18:00						
	21:00						
9/9/2009	0:00						
	3:00						
	6:00						
	9:00						
	12:00						
	15:00						
	18:00						
	21:00						
9/10/2009	0:00						
	3:00						
	6:00						
	9:00						
	12:00						
9/11/2009	15:00	< 1	< 1		< 1	< 1	
	18:00	< 1	< 1	< 2	< 1	< 1	< 2
	21:00	< 1	< 1		< 1	< 1	
	0:00	< 1	< 1		< 1	< 1	
	3:00	< 1	< 1	8.0	< 1	< 1	25.0
	6:00	< 1	< 1		< 1	< 1	
	9:00	< 1	< 1		< 1	< 1	
	12:00	< 1	< 1	21.0	< 1	< 1	77.0
9/12/2009	15:00	1.0	< 1	48.0	2.0	< 1	65.0
	18:00	4.1	< 1		3.1	< 1	
	21:00	< 1	< 1		< 1	< 1	
	0:00	< 1	< 1	19.0	< 1	< 1	195.0
	3:00	< 1	< 1		< 1	< 1	
	6:00	2.0	< 1		2.0	< 1	
	9:00	Present	Absent		Present	Absent	
	12:00	12.1	< 1	146.0	4.1	< 1	> 738
9/13/2009	15:00	Present	Absent	158.0	Present	Absent	> 738
	18:00	14.5	< 1		8.5	< 1	
	21:00	Present	Absent		Present	Absent	
	0:00	35.9	< 1		36.9	< 1	
	3:00	Present	Absent		Present	Absent	
	9:00	> 2419.6	< 1	183.0	> 2419.6	< 1	223.0
# of SAMPLES		22	22	8	22	22	8
MAXIMUM		> 2419.6	< 1	183.0	> 2419.6	< 1	> 738
MINIMUM		< 1	< 1	< 2	< 1	< 1	< 2

POST CHLORINATION & MICROBIOLOGICAL DATA

DATE	TIME	PS4 (Post chlorination well)		
		TOTAL COLIFORMS	FECAL COLIFORMS/E.C. coli	HPC
9/8/2009	12:00			
	15:00			
	18:00			
	21:00			
9/9/2009	0:00			
	3:00			
	6:00			
	9:00			
	12:00			
	15:00			
	18:00			
9/10/2009	21:00			
	0:00			
	3:00			
	6:00			
	9:00			
	12:00			
	15:00			
9/11/2009	18:00			
	21:00			
	0:00			
	3:00			
	6:00			
	9:00			
	12:00	< 1	< 1	< 2
9/12/2009	15:00	< 1	< 1	< 2
	18:00	< 1	< 1	
	21:00	< 1	< 1	
	0:00	< 1	< 1	< 2
	3:00	< 1	< 1	
	6:00	< 1	< 1	
	9:00	Absent	Absent	
9/13/2009	12:00	< 1	< 1	< 2
	15:00	Absent	Absent	< 2
	18:00	< 1	< 1	
	21:00	Absent	Absent	
	0:00	< 1	< 1	
	3:00	Absent	Absent	
	9:00	< 1	< 1	< 2

# of SAMPLES	15	15	6
MAXIMUM	< 1	< 1	< 2
MINIMUM	< 1	< 1	< 2

PS4 Chlorine		
Dosage	Free Residual mg/L	Total Residual mg/L
*Only applicable when water is distributed to residents.		
2.3	1.2	1.4
2.3	1.5	1.7
2.0	1.3	1.6
2.0	1.0	1.2
2.0	0.8	0.8
2.0	0.4	0.7
1.9	0.9	1.1
2.0	1.4	1.7
1.8	1.3	1.7
1.8	1.3	1.7
1.9	1.3	1.8
2.7	1.2	1.6
1.9	1.2	1.7
2.6	1.3	1.7
2.5	1.2	1.5
1.9	2.6	3.0

MAXIMUM	2.7	2.6	3.0
MINIMUM	1.8	0.4	0.7
AVERAGE	2.1	1.2	1.6

APPENDIX G

Ozone Contactor Basin Diagram

002336

EQUIPMENT
LIFT

1 1/2-OZ-SS
UP
(TYP.)

WALL MOUNTED
HOSE REEL

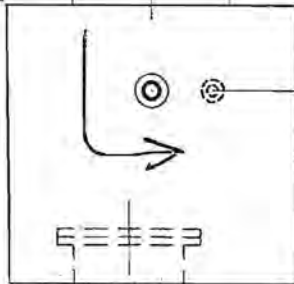
PI

B

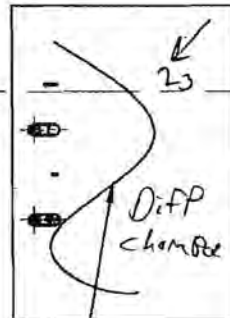
OZM9

5'

12



7



Diff
chamber

3/4-SW-
CU2 (TYP.)

CD11

Comp 1

3/4-SA-SS
@ EL. 743.0 (TYP. OF 3)

FLR, EL.
723.5

OZONE DIFFUSERS
SECTION
SEE SECTION 2, OZM13
(TYP.)

23

4.53

Comp 2

32.33

Comp 3

C
OZM13

SAMPLE PENETRATION

(TYP)

Comp 4

TYPICAL CONTACTOR
DRAIN PIPING

Comp 5

3/4-SA-SS
@ EL. 732.0 (TYP. OF 3)

24'

23

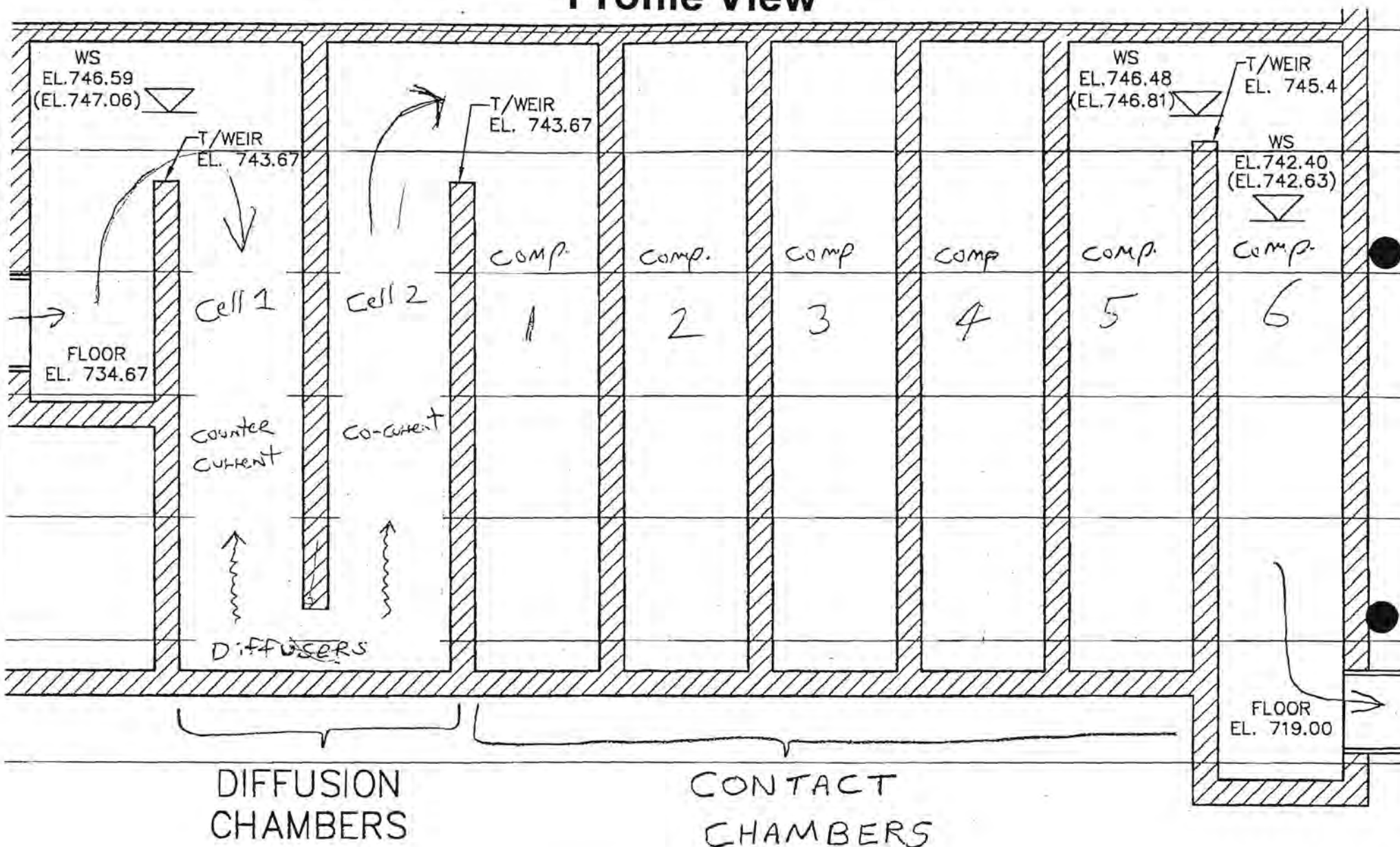
Comp 6

3/4-HSW-CU2
UP

5

Ozone Contactor Basin (1 of 3)

Profile View



APPENDIX H

C*T Calculation

Flint WTP CT Calculation

1. Ozone: @ 12 MGD per contactor train

		HRT	T10	O3 Conc.	CT
Diffusion Chamber Cell 1	Counter Current	0.72 min	0.36 min		
Diffusion Chamber Cell 2	Co-Current	0.72 min	0.36 min		
Contact Chamber 1		1.76 min	0.88 min		
Contact Chamber 2		3.22 min	1.61 min		
Contact Chamber 3		3.22 min	1.61 min		
Contact Chamber 4		3.22 min	1.61 min		
Contact Chamber 5		3.22 min	1.61 min		
Contact Chamber 6		2.48 min	1.24 min		

3 ozone monitoring points: end of diffusion cell 2, end of chamber 3, end of chamber 6

Ozone concentrations are as follows: Diff Cell 1 - 0.15 mg/l - detectable residuals are not maintained through Chambers #3 and 6; thus they cannot be used in the CT dtm.

Dosage Diffusion Chamber Cell 1: Counter - Current Flow

Cell 1 cannot be credited CT since the ozone concentration is not measured at the exit point of Cell 1 prior to the second ozone diffuser in Cell #2.

$$C = C_{out} = 0.00 \text{ mg/l}$$

$$C_T = C \times T_{10}$$

$$C_T = 0.0 \text{ mg/l} \times 0.36 \text{ min} = 0.000 \text{ min} \cdot \text{mg/l}$$

$$C_T \text{ needed for 3 - Log removal of giardia @ 0.5 deg. C} = 2.9 \text{ min} \cdot \text{mg/l}$$

$$C_T \text{ needed for 4 - Log removal of virus @ 0.5 deg. C} = 1.8 \text{ min} \cdot \text{mg/l}$$

$$\text{Inactivation Ratio: } C_{T \text{ calc}}/C_{T 99.9} = 0.000 \text{ min} \cdot \text{mg/l} / 2.9 \text{ min} \cdot \text{mg/l} = 0.00$$

$$\text{Giardia Inactivation: } 3 \times \text{inactivation ratio or } 3 \times 0.00 = 0.0$$

$$\text{Inactivation Ratio: } C_{T \text{ calc}}/C_{T 99.9} = 0.000 \text{ min} \cdot \text{mg/l} / 1.8 \text{ min} \cdot \text{mg/l} = 0.00$$

$$\text{Virus Inactivation: } 4 \times \text{inactivation ratio or } 4 \times 0.00 = 0.0$$

Dosage Diffusion Chamber Cell 2: Co - Current Flow

$$C = (C_{out} + C_{in})/2$$

$$C = (0.15 \text{ mg/l} + 0.00 \text{ mg/l})/2 = 0.075 \text{ mg/l}$$

$$C_{T \text{ calc}} = C \times T = 0.075 \text{ mg/l} \times 0.36 \text{ min} = 0.027 \text{ min} \cdot \text{mg/l}$$

$$C_T \text{ needed for 3 - Log removal of giardia @ 0.5 deg. C} = 2.9 \text{ min} \cdot \text{mg/l}$$

C_T needed for 4 - Log removal of virus @ 0.5 deg. C - 1.8 min - mg/l

Inactivation Ratio: $C_{T \text{ calc}}/C_{T 99.9} = 0.027 \text{ min-mg/l} / 2.9 \text{ min-mg/l} = 0.0093$

Giardia Inactivation: 3 X inactivation ratio or 3 X 0.0093 = **0.028**

Inactivation Ratio: $C_{T \text{ calc}}/C_{T 99.99} = 0.027 \text{ min-mg/l} / 1.8 \text{ min-mg/l} = 0.015$

Virus Inactivation: 4 X inactivation ratio or 4 X 0.015 = **0.06**

Six Ozone Contact Chambers:

No credit given since ozone residual cannot be maintained consistently through the contact chambers.

Total giardia inactivation (Ozone process) = 0.028 log removal

2. Intermediate Chlorination: Intermediate CL2 added at plate settler effluent

Lime softening solids contact unit detention times:

East unit: 114 min @ 19 MGD

West unit: 118 min @ 17 MGD

Assume baffle factor of 0.5 and use east basin for C_T calc.

$T_{10} = 114 \text{ min} \times 0.5 = 57 \text{ min}$

Assume pH 7.5, Temp 0.5 C, lowest CL2 on MOR - 0.1 mg/l

$C_T = 0.1 \text{ mg/l} \times 57 \text{ min} = 5.7 \text{ min-mg/l}$

CT needed for 0.5 log removal giardia (pH 7.5, 0.5 C, CL2 < 0.4) = 40 min-mg/l

CT needed for 2 log virus removal is 6 min-mg/l

Giardia inactivation ration:

Inactivation Ratio: $C_{T \text{ calc}}/C_{T 99.9} = 5.7 \text{ min-mg/l} / 40 \text{ min-mg/l} = 0.143 \text{ min-mg/l}$

Giardia Inactivation: 0.5 X inactivation ratio or 0.5 X 0.143 = **0.072 min-mg/l**

Inactivation Ratio: $C_{T \text{ calc}}/C_{T 99.99} = 5.7 \text{ min-mg/l} / 6 \text{ min-mg/l} = 0.95$

Virus Inactivation: 2 X inactivation ratio or 2 X 0.95 = 1.9

Total giardia inactivation (contact unit): 0.072 min-mg/l

3. CT Credit through Filtration: 12 filters total at 3.0 MGD each

Water depth above filter - 7.92 ft, media thickness - 2.5 ft.

Volume: $700 \text{ sqft} \times (7.92 \text{ ft} + 2.5 \text{ ft}) = 7,244 \text{ Cuft}$ or 54,559 gallons

$DT = 54,577 \text{ gal} / 3,000,000 \text{ gpd} = 26.2 \text{ min}$

Assume BF of 0.7, thus $T_{10} = 0.7 \times 26.2 \text{ min} = 18.3 \text{ min}$

$CT = 0.1 \text{ mg/l} \times 18.3 \text{ min} = 1.83 \text{ min-mg/l}$

CT needed for 0.5 log removal giardia (0.5 deg, pH 7.5, CL2 <0.4) = 40 min-mg/l

CT needed for 2 log removal virus = 6 min-mg/l

Giardia inactivation ratio; $1.83 \text{ min-mg/l} / 40 \text{ min-mg/l} = 0.046$

Giardia inactivation ; $0.5 \times 0.046 = 0.023$

Virus inactivation ration; $1.83 \text{ min-mg/l} / 6 \text{ min-mg-l} = 0.31$

Virus inactivation ; $2.0 \times 0.31 = 0.62$

Total giardia inactivation (filters): 0.023 min-mg/l

2. Post Chlorination:

The Flint WTP can add chlorine to their 3 MGAL well during emergency operation. The following calculation is based upon a flow rate of 12 MGD and using a reservoir baffling factor of 0.3. Since the chlorine demand is used up during intermediate chlorination, a chlorine residual of no less than 1.0 mg/l in the clearwell (after post chlorination) is easily attainable. For the purpose of the CT calculation, a 1.0 mg/l free chlorine residual is used.

Assume: 0.5 deg C, pH 7.5 - unsoftened, 1.0 mg/l CL2

Detention Time (D_T) = $3,000,000 \text{ Gal} / 13,000,000 \text{ GPD} = 0.25 \text{ days}$ or 360 minutes

T_{10} (based on CL2 analyzer test) was 120 min on first test and 100 minutes on 2nd test.

Baffle factor = $T_{10} / D_T = 100 / 360 = 0.28$

$$C_T = CL_2 \times 0.3(D_T) = 1.0 \text{ mg/l} \times 0.28(360 \text{ minutes}) = 100 \text{ mg/l} - \text{min}$$

C_T needed for 1/2 - Log removal of giardia @ 0.5 deg. C - 42 min - mg/l

C_T needed for 2 - Log removal of virus @ 0.5 deg. C - 6 min - mg/l

$$\text{Inactivation Ratio: } C_{T \text{ calc}}/C_{T 99.9} = 100 \text{ min-mg/l}/42 \text{ min-mg/l} = 2.38$$

$$\text{Giardia Inactivation: } 0.5 \times \text{inactivation ratio or } 0.5 \times 2.38 = \mathbf{1.19}$$

$$\text{Inactivation Ratio: } C_{T \text{ calc}}/C_{T 99.99} = 100 \text{ min-mg/l}/6 \text{ min-mg/l} = 16.7$$

$$\text{Virus Inactivation: } 2 \times \text{inactivation ratio or } 2 \times 16.7 = \mathbf{33.4}$$

Total giardia inactivation = 1.19 log removal

Total virus inactivation = 33.4 log removal

3. Total Process:

Total giardia inact. = log removal (O3 + int. CL2 contact units & filters + clearwell)

$$= 0.028 + 0.072 + 0.023 + 1.19 = \mathbf{1.31 \text{ Log removal}}$$

Total virus inact. = log removal (O3 + CL2 in contact units & filters + clearwell)

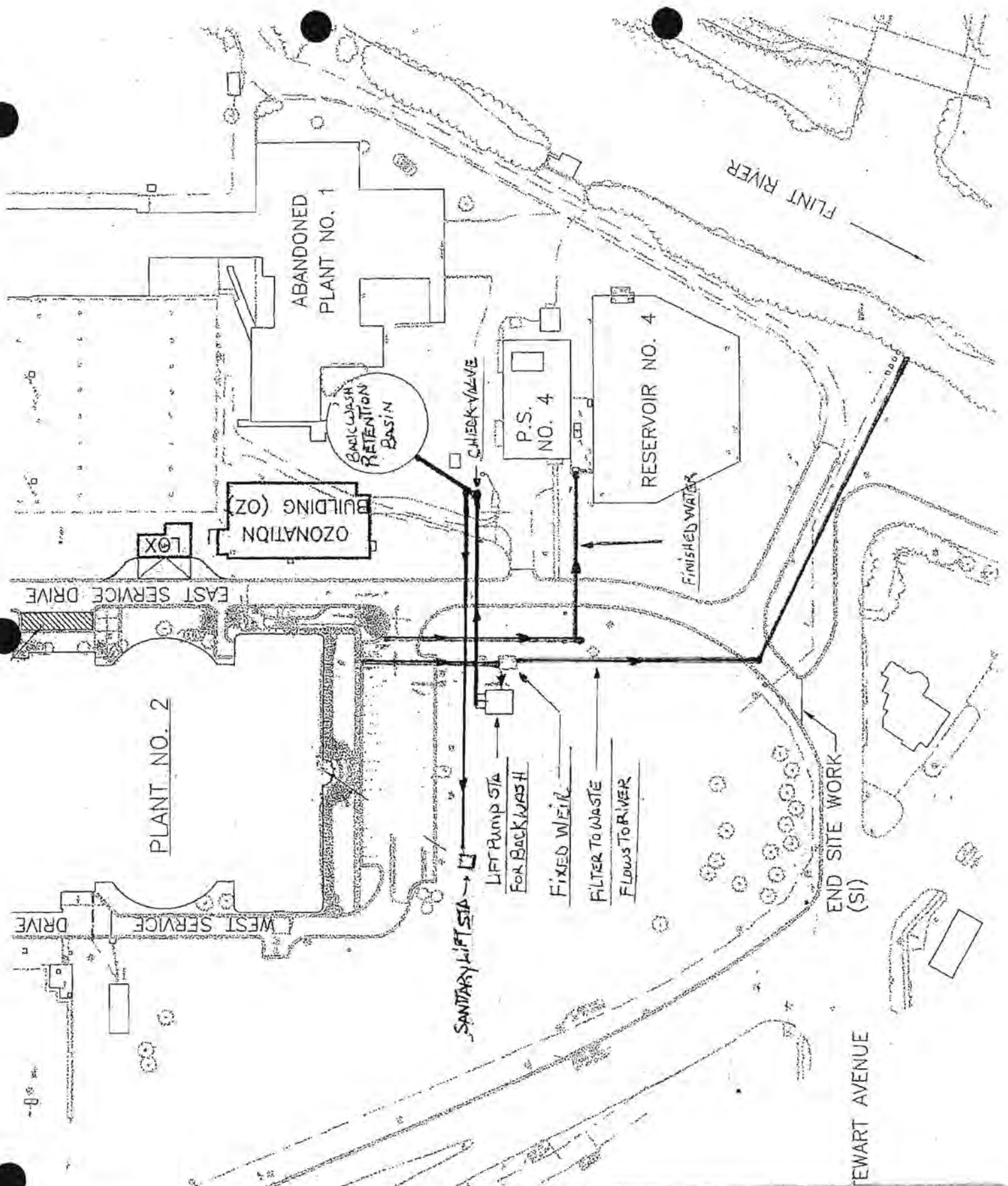
$$= 0.06 + 1.9 + 0.62 + 33.4 = \mathbf{36 \text{ Log removal}}$$

4. Conclusion:

Based upon the available treatment, assumptions, and calculations above, the Flint WTP has can provide adequate CT.

APPENDIX I

Waste Water Flow Schematic

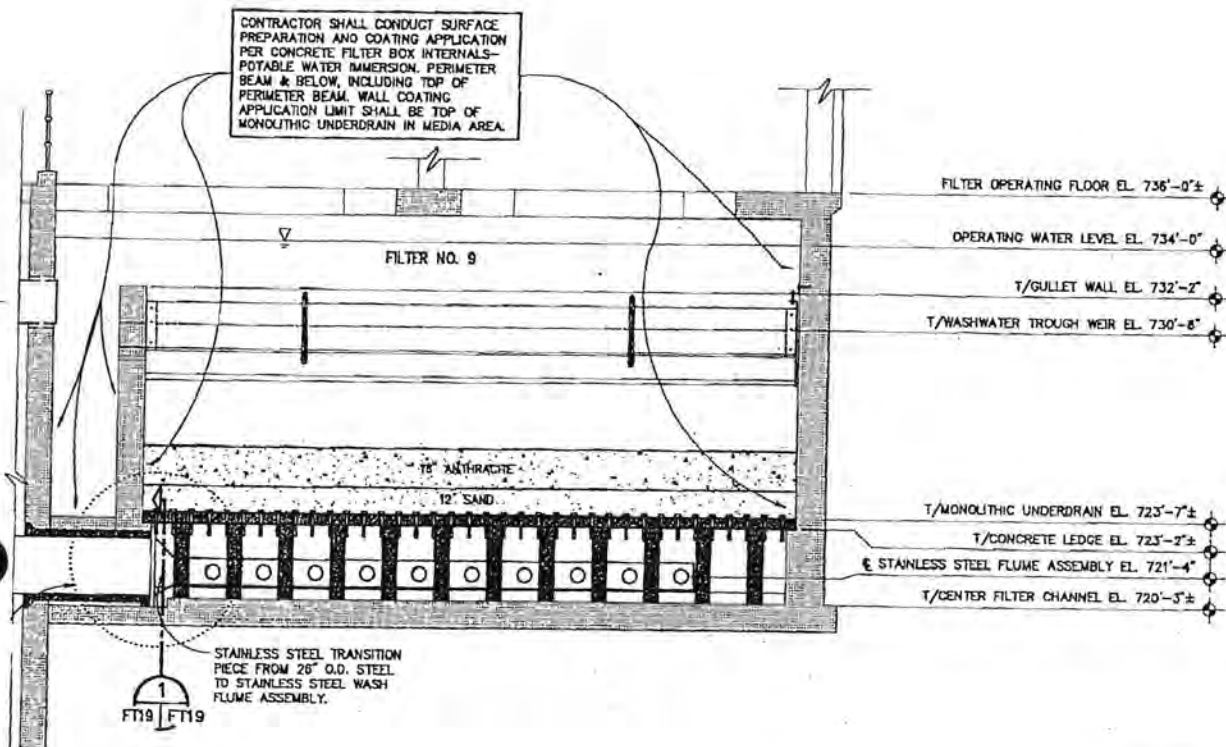
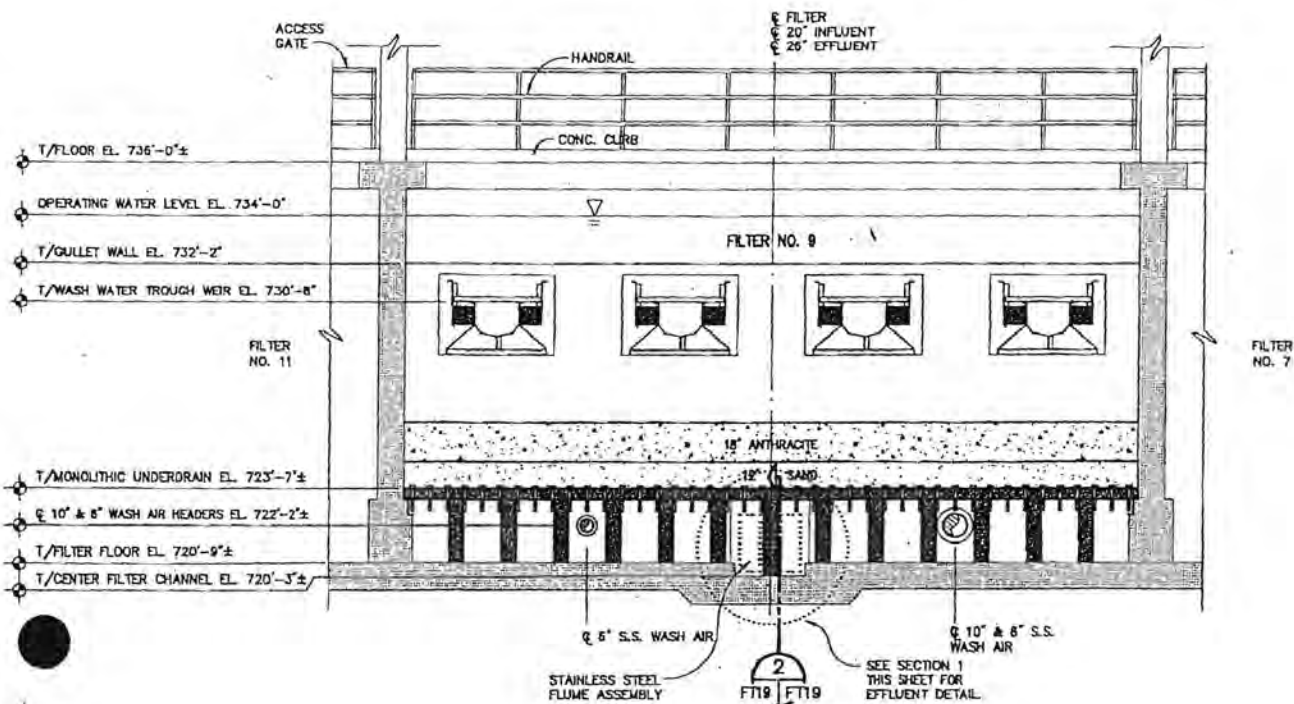


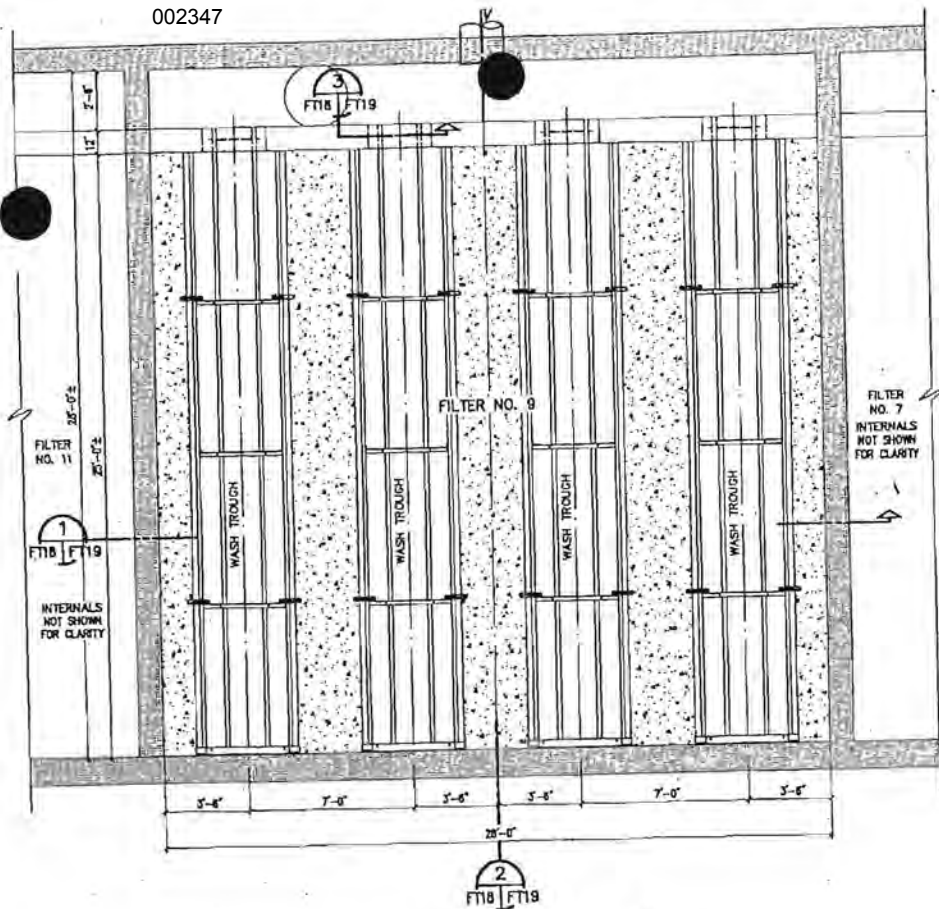
DURING NORMAL PLANT RUN TEST OPERATION FINISHED WATER EXITS PLANT THROUGH FILTER TO WASTE. IT FLOWS OVER FIXED WEIR AND ENTERS THE RIVER.

DURING BACKWASH WATER FLOWS THROUGH FILTER TO WASTE. PUMPS ARE TURNED ON IN BACKWASH LIFT PUMP CHAMBER. THE WATER IS PUMPED TO BACKWASH RETENTION BASIN. THE PUMPS KEEP THE LEVEL BELOW THE WEIR AND FROM ENTERING THE RIVER AND FLOW FROM BASIN TO SANITARY

APPENDIX J

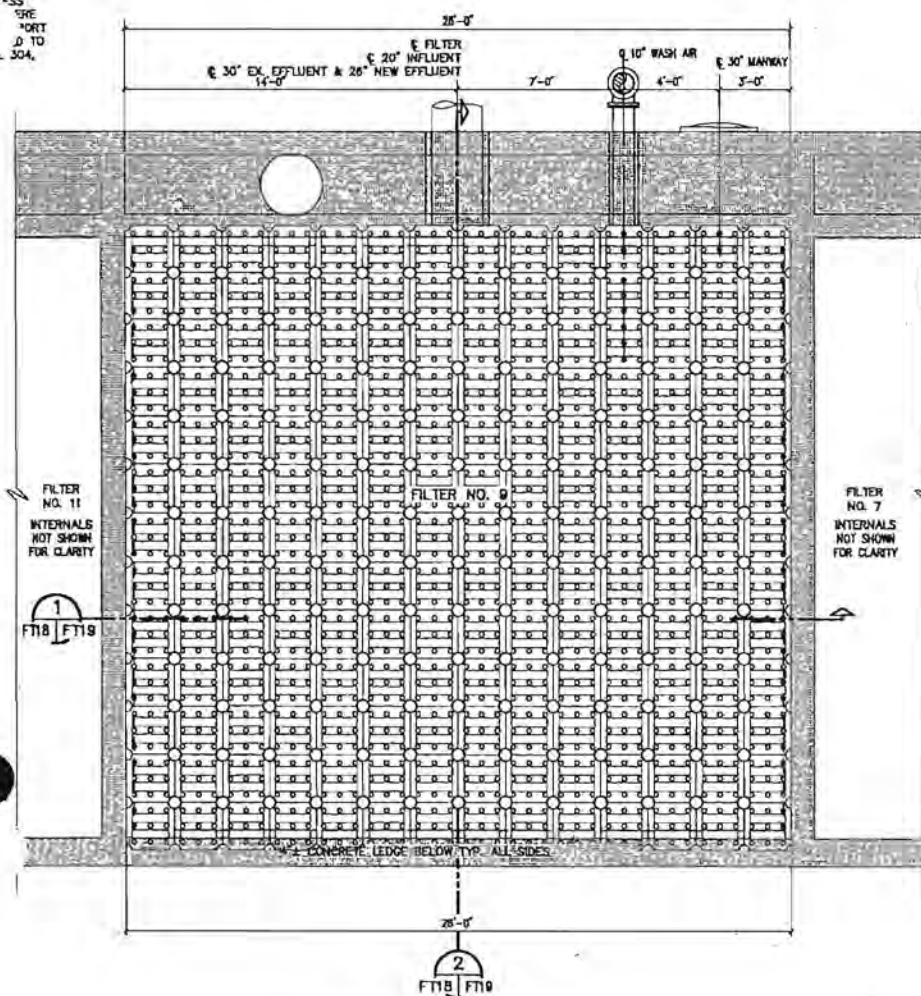
Filter Schematic



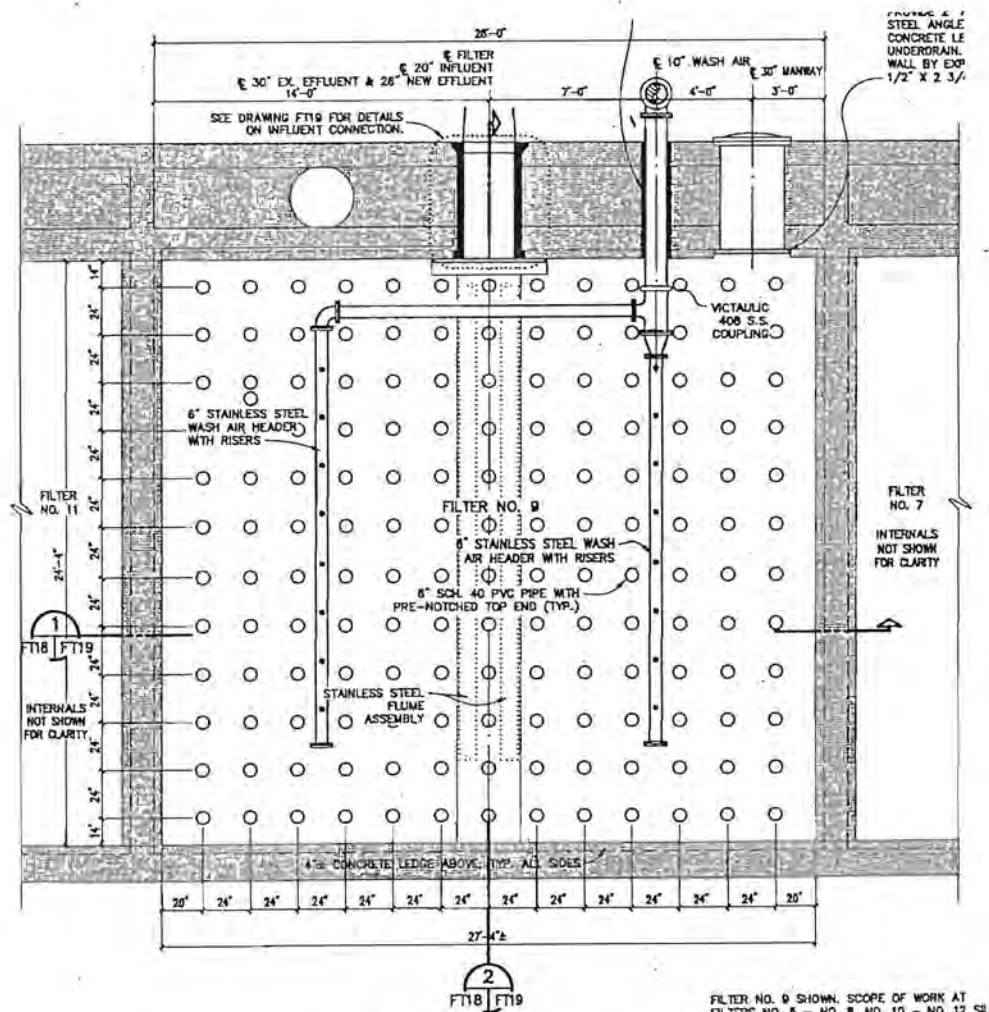


FILTER PLAN - EL. 732'

304 STAFFESS
OPEN FIRE
PTED SHORT
L BE D TO
IORS, 1111 304.



FII TFR PI AN - FI 724'



FILTER PLAN - EL. 722'

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

FILTER NO. 9 SHOWN. SCOPE OF WORK AT
FILTERS NO. 5 - NO. 8, NO. 10 - NO. 12 SEE

**CITY OF FLINT
WATER SYSTEM
SANITARY SURVEY
JANUARY 2013**



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

April 18, 2013

Mr. Daugherty Johnson, Utilities Administrator
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502

WSSN: 02310

Dear Mr. Johnson,

SUBJECT: City of Flint, Water Distribution System Sanitary Survey

This letter confirms my visits with Mr. Robert Bincsik, Mr. Brent Wright, and Mr. Glen Thomas on December 13, 2012, December 18, 2012, and January 16, 2013, and summarizes the subsequent review and discussion of the water supply facilities serving the city of Flint. The purpose of this meeting 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). In addition, the enclosed Water System Sanitary Survey was updated to gather information on the Flint water distribution system.

Our updated survey visit confirms that the City of Flint Water System Reliability Study – Phase I has been completed and our review comments for Phase 2 were provided to your consultant. The survey also acknowledges some improvement in the city's hydrant and valve program; however deficiencies in the valve program need to be corrected.

The following table summarizes our findings from our survey of the water system:

Survey Element	Findings
Source (Including P.S. 4)	Not Applicable – see WTP
Treatment	Not Applicable – see WTP
Distribution System	Deficiencies Identified
Finished Water Storage	Recommendations made
Pumps (All dist. Pumping)	Deficiencies Identified
Monitoring & Reporting	Recommendations made
Management & Operations	Recommendations made
Operator Compliance	Recommendations made

Security	Recommendations made
Financial	Recommendations made
Other	Not Applicable

The following deficiencies are violations of Act 399 and must be resolved in order to return the water system to compliance.

1. R 325.11108 (1) of the Act 399 requires a Type-I public water supply (PWS) to provide sufficient distribution system valving to minimize interruptions in service and minimize sanitary hazards during construction or repairs. R 325.11111 (1) of Act 399 requires a Type-I PWS to maintain adequate records on the operation of the water distribution system, including the location and type of maintenance, and the type of materials and appurtenances used. As part of meeting these requirements, further work is needed towards correcting the deficiencies in the valve program. Accurate records need to be completed for approximately one third of the remaining valves and a valve maintenance program needs to be established. Adequate level of staffing and acquisition of a reliable vehicle to transport the Water Distribution Division's (WDD) valve turning machine are needed in order to establish an effective valve program.
2. Establish financial capacity to provide reserve funds for transmission/distribution improvements outlined in the city's capital improvement program (CIP).
R 325.11105 (1) of Act 399 requires water distribution systems to have sufficient capacity to meet peak demands including fire flow demands where fire protection is provided and maintaining minimum pressures of 35 pounds per square inch (psi) for domestic service and 20 psi during emergencies, including firefighting. Phase 2 of the Reliability Study (RS) (draft) identifies areas in the western portion of the city that don't appear to meet the minimum criteria. The condition of the west transmission system limits the ability to provide the desired level of fire protection in the Martin Luther King Boulevard, Welch Road, DuPont Street, and Pasadena Avenue corridor. A construction permit to replace deficient transmission piping along this corridor has been issued several times; however, the city has not proceeded with replacing the main. The RS has also identified other distribution – transmission improvements that are needed and are included as part of the proposed 6-year CIP.

The city needs to proceed with water distribution system improvements in accordance with the 6-year CIP. Please provide us with a response as to how the city intends to correct water distribution system deficiencies. Critical steps need to include; identifying an adequate rate structure (discussed in the recommendations section), developing a prioritized capital improvements plan, and establishing a timeline by which these objectives and major projects are completed.

3. R 325.11011 of Act 399 requires a pumping facility to have sufficient capacity to meet the service area demands with the largest unit removed from service.
R 325.11206 requires the PWS to be capable of providing a continuous supply of finished water to the entire distribution system during periods when normal power

service is interrupted. The Torrey Road pump station has only one operable pump along with no provisions for stand-by power. This facility plays an important role in providing adequate water service to the western portions of the city including the Hospital Hill area. The Cedar Street pump station lacks stand-by power and is also critical in maintaining adequate service to Flint's distribution system. Also, the condition of the electrical switchgear and lack of replacement parts at the Cedar Street station compromises the reliability of the pump station and must be addressed.

It is our understanding that the city intends to proceed with an upgrade of the Torrey Road station in 2013 and that adequate funds are in place for the work. The city needs to proceed with and complete the work needed at this station. Finally, we are requesting the city to respond to our office by no later than June 21, 2013, with a proposed timeframe by which the electrical improvements and stand-by power provisions can be completed at the Cedar Street station.

4. R 325.11602 of Act 399 requires the city of Flint to have a current water system general plan. The general plan is required to show the general layout of the entire water system, including treatment systems and distribution system, and the location of valves, hydrants, storage tanks, watermains, pumps, wells, and pumping facilities. Based upon our survey visit, the Water Service Center (WSC) has an outdated water system general plan that was prepared in 1991. R 325.11603 of Act 399 (2) requires the city of Flint to provide an updated general plan within 6 months of receiving written notification from the DEQ. The city's 1991 water system general needs to be updated and a similar sized copy be provided to WSC and water treatment plant (WTP) staff by no later than November 1, 2013.

Next, it is hoped that the following recommendations will prove useful in enhancing the operation and maintenance of your water supply.

1. Perform an inspection of the 3.0 million gallon well and, if needed, complete repairs on the concrete base around each manhole vent. A copy of an inspection report or summary of the inspection should also be provided to the DEQ.
2. Perform an inspection of the Cedar Street reservoir and provide the DEQ with a copy of the inspection report.
3. The DEQ encourages the city to maintain its efforts towards promoting and maintaining operator certification. Also, select a water distribution system back-up operator. The back-up operator must hold an active S-4 (or higher) distribution system license.
4. Complete Phase 2 of the RS in accordance with R 325.11203 of Act 399 that address our review questions/comments from the draft report and provide the DEQ with a final copy for review and approval.

5. We encourage the city of develop a rate structure that incorporates full cost pricing to allow for water system capital improvements to proceed. Phase 2 of the RS outlines the development of an asset management program that will play an important role in assisting the city in establishing an adequate water rate structure. The city needs to continue working with their consultant towards establishing an effective asset management program and an on-going CIP. We will also be discussing future requirements that the city will need to meet regarding asset management and maintaining an active CIP.
6. WTP staff prepare a WTP operation report each time the WTP is placed into operation (routine test run or emergency operation). The scope of operation report that reflects WTP emergency operation needs to be expanded to include the average, maximum, and minimum values for the critical treatment parameters (turbidity, chemical applied, etc.).
7. Additional clerical assistance may be needed for recordkeeping, reporting, and maintaining cross connection control program (CCCP) inspection schedules. The CCCP workload should be reviewed to determine the level of staffing needed to maintain effective program implementation.
8. WTP staff have prepared a draft water system Emergency Response Plan (ERP). The draft ERP needs to be finalized and include discussion of the various plans and agreements that are in place and can be utilized in mitigating water related emergencies. Such plans include; water system general plan, safety plans, water quality monitoring plans, and mutual aid agreements. The ERP also needs to include a water shortage response plan. The water shortage response plan needs to address various water shortage scenarios specific to Flint, including; an interruption in water service from the Detroit Water and Sewerage Department, large distribution/transmission break, loss of one or more pumping stations, etc. The ERP will serve as part of mitigating these water related shortages. The water shortage response plan will also need to be included with the RS and has been discussed with your consultant.

The use of swimming pool chlorine for emergency water system disinfection must be removed from the ERP. Any compound used for water distribution disinfection shall be an ANSI/NSF Standard 60 approved product in accordance with R 325.12102 of Act 399.

9. Maintain adequate communication between the WDD and the fire department concerning hydrant color coding, hydrant use, and condition of hydrants. We also recommend that WDD operators estimate the volume of water used for flushing. This will help to determine the component of unaccounted water due to flushing. We also concur with the WSC's procedure that local contractors must follow to use hydrants for obtaining service water. We also encourage the installation of a filling station at the WSC to further serve this purpose.

Mr. Daugherty Johnson

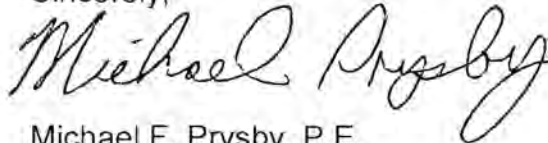
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April 18, 2013

Please submit a letter by *June 21, 2013*, that outlines the city of Flint's plans and schedule to address the above items.

If you have any questions, feel free to contact me at (517) 335-6122; prysbym@michigan.gov; or Department of Environmental Quality, Office of Drinking Water and Municipal Assistance, Lansing District Office, 525 West Allegan Street, 4th Floor North, P.O. Box 30242, Lansing, Michigan 48909-7742.

Sincerely,



Michael F. Prysby, P.E.
District Engineer
Field Operations Section
Office of Drinking Water and
Municipal Assistance

Enclosure
mfp/jlr

cc: Mr. Robert Bincsik, Water Distribution Supervisor
Mr. Brent Wright, Water Plant Superintendent
Mr. Edward Kurtz, Emergency Manager, City of Flint
Mr. Howard Kroft, Utilities Director, City of Flint
Ms. Inez Brown, Clerk, City of Flint

DEQ Office Address 1
DEQ Office Address 2
Phone:
Fax:

WSSN: 2310

Office of Drinking Water and Municipal Assistance
Lansing District Office

Water System Sanitary Survey
Flint Water System - Water Distribution
Jan-13



Sanitary Survey of Community Water Supply - Review Summary

Water Supply: City of Flint - DistributionCounty: GeneseeEvaluator: Michael PrysbyWSSN: 02310District: 11Date: 1/16/2013

Category	Comment	N/A	NotEv	NoD/R	Rec	Def	SigDef
Source		x					
Construction & Maintenance		x					
Standby Power		x					
Isolation		x					
Source Water Protection		x					
Capacity		x					
Treatment		x					
Disinfection		x					
Fluoride		x					
Phosphate Addition		x					
Softening		x					
Iron/Manganese Removal		x					
Arsenic Removal		x					
Pretreatment		x					
Filtration (gravity or membranes)		x					
C*T		x					
Other		x					
Distribution System						x	
Interconnections w/ Other WS				x			
Hydrants & Valves						x	
Service Lines & Metering				x			
General Plan						x	
Cross Connections					x		
Construction & Maintenance						x	
Capacity					x		
Finished Water Storage					x		
Construction & Maintenance					x		
Controls				x			
Capacity				x			
Pumps (All Pumping Facilities)						x	
Construction & Maintenance						x	
Controls						x	
Capacity				x			
Monitoring & Reporting					x		
Bacteriological Monitoring				x			
Chemical Monitoring				x			
MOR or Annual Pumpage Report					x		
Consumer Confidence Report				x			
Analytical Capabilities				x			
System Management & Operations					x		
Owner Responsibility				x			
Capacity Development			x				
Reliability Study					x		
Operations Oversight				x			
Permits				x			
Operator Compliance							
Operator Certification					x		
Technical Knowledge & Training					x		
Security							
Emergency Response Plan					x		
Site Security (Fences, Alarms...)				x			
Financial							
Rates					x		
Budget & Capital Imp. Plan					x		
Other		x					

N/A - Not Applicable

NotEv - Not Eval; NoD/R - No Deficiencies/Recommendations Made

Rec - Recommendations Made

Def - Deficiency; SigDef - Significant Deficiencies Identified

WATER SYSTEM REVIEW (Distribution)

GENERAL

Basic Information

WSSN: 2310 Supply: City of Flint County: Genesee
 Dates: 12/18/2012 & 1/16/2013 Reviewed by: MFP District: 11

Primary Contact: Robert Bincsik
 SDWIS Role: _____
 Title: Water Distribution Supv
 Telephone: 810-766-7359
 Cell Phone: _____
 Pager: _____
 Fax: _____
 e-mail: _____

Copy To: Brent Wright Glen Thomas
 SDWIS role: _____
 Title: WTP Supervisor Inspector
 Telephone: 810-787-6537 810-787-6537
 Cell Phone: 810-691-0355
 Pager: _____
 Fax: _____
 e-mail: _____

Address: Flint Water Service Ctr
3310 East Court St
Flint, MI 48506

Address: Flint Water Plant Utilities/Cross
4500 N. Dort Hwy Connection Division
Flint, MI 48505 5400 N. Dort Hwy

Population: 102,400 Year: 2010 Basis: 2010 Census

Operator Certification

Distribution Class: S-1

Operator in Charge:	<u>Robert Bincsik</u>	Cert.:	<u>S-1, F-4</u>
Back-up Operator:	_____		_____
Other Operators:	<u>Jeff Church</u>		<u>S-3</u>
	<u>Mark Pavwoski</u>		<u>S-3 - lapsed</u>
	<u>Paul Simpson</u>		<u>S-2</u>
	<u>Howard Swickard</u>		<u>S-2</u>

Do the operators receive adequate training? yes
 If not, what and why? _____

Flint purchases water from Detroit from the Detroit-Lake Huron WTP and is transmitted to the city via the 72-inch transmission main (pipeline). Water enters Flint's portion of the pipeline at the Baxter & Potter metering station and is then transmitted to Control Station #2 at the Flint WTP. Control Station #2 directs water to the 20 Mgal Dort Reservoir and the 2 Mgal elevated tank. Water from the Dort Reservoir is directed to a smaller 3 Mgal reservoir at Pump Station #4. Pump Station #4 distributes water to Flint's distribution system that consists of approximately 550 miles of piping ranging from 2-inch to 42-inch. The distribution system has substantial storage volume (57 MGAL) provided by 5 storage facilities. The distribution system also has an in-line pump station at Torrey Road and two pump stations (Cedar Street and Westside) with adjacent storage (12 Mgal and 20 Mgal respectively).

Ownership

Ownership: City
 Annual Fee: paid to date

Operator Comments

The city of Flint water distribution system is operated and maintained by the Utilities Department. The Utilities Department is broken down into five operating divisions or cost centers out of which three play a key role in operating and maintaining the water distribution system. These divisions are: The Water Service Center, The Water Treatment Plant, and the Utilities/Cross Connections Division. Appendix A Illustrates the structure and the Utilities Dept. and the various cost centers.

The Water Service Center's (WSC) structure is broken down into two divisions, Water Distribution Division (WDD) and Sewer Maintenance Division. The WDD, supervised by Robert Bincsik, is responsible for operating and maintaining the water distribution system piping, hydrants, and valves. The WDD also conducts meter reading, replaces meters, and maintains distribution system records and maps. The WDD is broken into two main branches. One branch focuses mainly on watermain operation and maintenance while the other branch is dedicated to meters. The WDD has not designated the back-up operator in charge.

Both branches have numerous operators at various levels of employee responsibility. Appendix A Illustrates the employee organizational chart for the WDD and shows the certification requirement among the various positions. The water distribution supervisor and foreman positions are required to have S-1 and S-2 certification respectively.

The water treatment plant (WTP) staff, supervised by Brent Wright, operates and maintains Flint's stand-by WTP (reference WTP Sanitary Survey). WTP staff, however, play an important role in distribution system activities including; operation and maintenance of the city's distribution system pumping stations, storage facilities, and points of connection to other water supplies. WTP staff also maintain some of the key programs including both the bacteriological and lead and copper monitoring programs. Finally, the WTP staff are responsible for monthly operation reporting, emergency response planning, and public relations.

The Utilities/Cross Connection Division, also supervised by Brent Wright, is responsible for implementing the city's Cross Connection Control Program. The division has one employee, Glen Thomas, who is responsible for conducting the routine inspections and maintaining records. A second employee, Yolanda Gray, assists with recordkeeping and reporting.

MDEQ Conclusions/Recommendations

Promotion of operation certification has improved. Although operators are responsible to obtain and maintain their certification, the city reimburses their cost. We are pleased that the city is promoting operator certification through reimbursement of the cost of operator training. Certified operators help to protect a utility's investment in their water system and to meet the Safe Drinking Water Act's requirements. We encourage the city to maintain this level of effort towards promoting operator certification.

The city has also selected Mr. Robert Bincsik as the designated Operator-in-Charge (OIC) for the water distribution system which fulfills the Michigan Safe Drinking Water Act's requirement of having a designated water distribution system OIC. The city; however, also needs to select a Back-up operator for the water distribution system. The designated back-up operator must hold an active S-4 (or higher) distribution system license.

Construction Permit History:

Below is a listing of projects that were completed to improve the reliability of the distribution system pumping facilities, distribution piping, and stand-by treatment facilities.

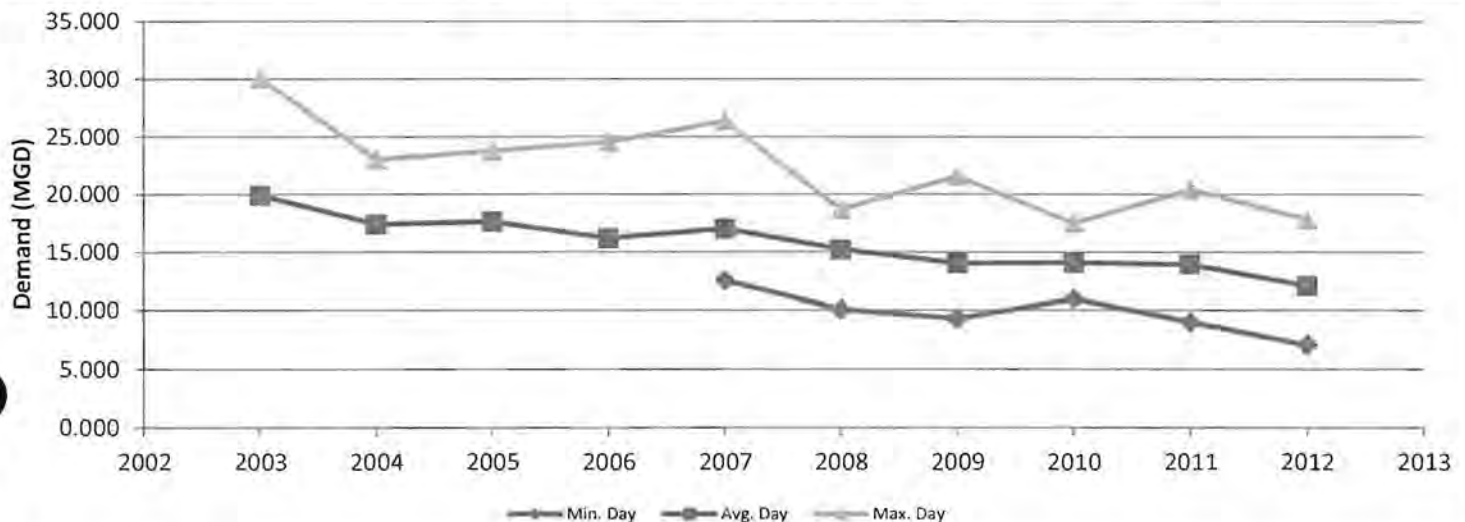
<u>CP Number</u>	<u>Date</u>	<u>Project</u>	<u>Description</u>
W891667	1/2/1989	Revisions to P.S. 4	CI Facilities at P.S. 4
W931368	11/30/1993	P.S. 4 Improvements	Two 20 MGD high service pumps, one 6 MGD high service pump, valving, appurtenances, etc.
W941607	12/1/1994	Westside Reservoir	Replacement of roofing system, masonry restoration and repairs to expansion joints.
W941678	12/20/1994	C.S. 3 & Dort Reservoir Inlet	Installation of PRV's at Dort Reservoir and C.S. 3.
W991021	3/23/1999	Cedar St. P.S. Valve Repl.	Replacement of pump control valves and installation of butterfly valves for each pump.
W991027	3/10/1999	GM	Replacement of 24" trans. main at GM to
W991208	6/21/1999	Transmission main Repl.	serve expansion of facility
W041019	2/24/2004	Beech and Wellington St. WM Replacement	
W041082	6/1/2004	Pierson Rd WM Replacement	
W051038	3/28/2005	Buckingham Alley WM Replacement	
W051127	8/1/2005	Sugar Maple Farms development	
W061054	4/6/2006	Chevrolet Ave WM Bridge Crossing	
W061184	9/26/2006	Flushing Road WM Repl - 6800 LF of 12-in WM	
W071001	1/3/2007	3rd Avenue WM Repl	
W071096	7/18/2007	Webster Road WM Repl - 2800 LF of 8-in WM	
W071098	7/18/2007	Saginaw Street WM Repl - 2300 LF of 16-in WM	
W071161	11/6/2007	Brush Alley WM	

Construction Permit History Continued:

<u>CP Number</u>	<u>Date</u>	<u>Project</u>	<u>Description</u>
W081081	7/14/2008	Holly Ave WM	
W081077	7/3/2008	Williams Street Relocation	
W091052	7/1/2009	Kettering Gateway Project	
W091080	11/23/2009	Chevrolet Ave WM Repl - 1100 LF of 16-in WM	
W101002	1/15/2010	Clio Rd WM Repl - 2500 LF of 12-in WM	
W101028	5/27/2010	MKL Ave WM Repl - 5900 LF of 12-in WM	
W111032	5/17/2011	Smith Village Redevelopment	
W121072	11/1/2012	Cedar Street Pump Station Improvements	
W121073	11/7/2012	Torrey Road Pump Station Improvements	

SOURCE

Capacity									
Year	Demand (MGD)					Max/Avg	Population History	G/C/D	% unacct. H ₂ O
	Max. Day	Date	Avg. Day	Min. Day	Date				
2003	30.050		19.900			1.51005			
2004	23.040		17.400			1.324138			
2005	23.790		17.640			1.348639			
2006	24.550		16.190			1.516368			
2007	26.380		17.020	12.530		1.549941			
2008	18.660		15.230	10.060		1.225213			
2009	21.570		14.030	9.280		1.53742			
2010	17.500		14.090	10.950		1.242016	102,400	137.6	
2011	20.410		13.920	9.010		1.466236	102,400	135.9	65%
2012	17.820		12.070	7.070		1.476388	102,400	117.9	



Five Year Max. Day	21.570
Ten year Max. Day	30.050
Five Year Avg. Day	13.868
Max Day for capacity requirements:	30.050

Purchase Contract

Principle Parties of Contract:	Flint & DWSD
Date of Contract:	No contract
Expiration Date:	year to year
Annual Volume Available by Contract:	MG
Maximum Day Available by Contract:	>70.0 MGD
Maximum Hour Available by Contract:	GPH
Maximum Pressure Allowed by Contract:	PSI
Minimum Pressure Required by Contract:	PSI

Comments:

Flint's average day and maximum day demand continues to decrease due to the continued loss of residential and industrial customer base.

Flint has not signed a new water service contract with the DWSD. Their agreement to maintain water service from the DWSD is renewed on a yearly basis.

STORAGE**Construction, Controls & Maintenance**

	Location: Dort Reservoir	Location: WTP	Location: WTP	Location: Cedar St	Location: Westside
SDWIS Fac. ID					
Volume	20 MG	2 MG	3 MG	20 MG	12 MG
Type	ground	elevated	ground	ground	ground
O.F. Elevation					
Date Constructed	1966	1952	1948	1948	1970
Date Inspected	2008	2012	1996	1997	2012
Date Painted Inside	na	1996	na	na	na
Paint System	na	epoxy	na	na	na
NSF Std 61 Compliant (Y/N)					
Date Painted Outside	na	1996	na	na	na
Cathodic Protection	na	yes	na	na	na
Tank Isolation Valve	yes	yes	yes	yes	yes
Tank Drain (Hydrant)		yes			
Altitude Valve		yes			
Mud Valve		yes			
High Alarm	yes	yes	yes	yes	yes
Low Alarm	yes	yes	yes	yes	yes
Type					
Total Head Range (Feet)		161.7 ft-175.6 ft			
Normal High Water Level			15 ft	18 ft	17 ft
Normal Low Water level			11 ft	15 ft	8 ft
Range of Operation ft	730-750	898	708.5-726	737.2-757.2	761.8-779
Normal/Average Pressure					
Data recording system	SCADA	SCADA	SCADA	SCADA	SCADA
Control Signal Type	analog to digital	analog to digital	analog to digital	analog to digital	analog to digital
Auxiliary Power to Controls?	yes	yes	yes	yes	yes
Control System Adequate?	ok	ok	ok	ok	ok
Vents Screened	18 vents	yes	3 vents	18 vents	
Overflow Screened			yes		
Access Hatches Locked	Yes	top of tank	No	Yes	via bldg access
Expansion Collar Lubricated	NA	no	NA	NA	NA
Deflection Plate	NA	no	NA	NA	NA
Overflow Splash Pad		no	yes	yes	yes
Site Fenced/Locked	yes	yes	yes	yes	yes
Operator Visit Frequency	3x/wk min.	3x/wk min.	3x/wk min.	3x/wk min.	3x/wk min.

Capacity

Usable Storage	57,000,000 gal	
Total Usable Storage	57,000,000 gal	57.000 mgd
Total Usable Storage/Max Day	264%	
Total Usable Storage/Avg. Day	398%	

Comments:

Storage Facility Comments:

Dort Reservoir:

The Dort reservoir is filled via Control Station #3. The main to CS 3 tees off the 72-inch main upstream of CS 2. CS #5 controls flow from both sides of the Dort reservoir to the 3 MGAL Well. WTP staff drained and inspected the reservoir in 1992 and found it to be in good condition. All 18 U-shaped vent structures above the reservoir are inspected each fall by WTP staff. The Dort reservoir was re-inspected in 2008.

3 MGAL Reservoir:

WTP staff drained and inspected the reservoir in 1996 and found it to be in good condition. The reservoir is equipped with an internal overflow weir and drain at an elevation of 720 feet. The reservoir also has three 24-inch manhole vents. Repairs to the concrete base surrounding these vents have not been completed.

Cedar Street Reservoir:

This 20 MGAL reservoir is divided into two 10 MGAL cells. The east cell has ten 12-inch U-shaped vents along with six access hatches. The west cell has eight 24-inch manhole vents along with five access hatches. Security locks were provided for all access hatches. A security camera with an alarm is also provided.

WTP staff inspected the reservoir in 1997 and found it to be in good condition. Cracking and spalling of the concrete walls was minimal. There was a very small amount of sedimentation. The baffle walls were composed of ceramic block and were in good condition.

The winter operating range as Cedar Street is 1.5 feet which equates to 1.5 mgal. The summer operating range is increased to 3.0 feet or 3.0 mgal and pumpage is rotated with the West Side reservoir on a daily basis during the summer. The reservoir is re-filled during the night. WTP staff have indicated that thermal stratification is posing a problem at Cedar Street and a solar powered mixing system is being considered. A re-inspection of Cedar Street reservoir is planned in 2013.

West Side Reservoir:

The reservoir was inspected in 2012 and existing cracks were repaired with an NSF approved epoxy in the fall of 2012.

The winter operating range is 1.5 feet which equates to 1.05 mgal. The summer operating range is increased to 4.0 feet or 2.8 mgal. Pumpage is rotated with the Cedar Street reservoir on a daily basis during the summer. The reservoir is re-filled at night.

2 MGAL Elevated Tank:

Pressure downstream from CS #2 to the elevated tank is throttled such that the tank operates within the upper portion of its operating range. The tank was inspected in 2007 and the tank's interior and exterior were repainted in the summer of 2009. Repairs to the tank's roof hatch, vent, riser access hatch were also completed. The tank is inspected yearly by Utility Services. Control of Westside and the Cedar Street pump stations are set by the water level in the elevated tank. The setpoints are HWL at 33 ft and LWL at 20 ft.

The city has five storage reservoirs that provide a total storage volume of 57 million gallons. These facilities, based on our survey and previous inspection records, appear to be in good condition. Based upon the survey, we recommend the following for the storage reservoirs listed below:

3 MGAL Reservoir: Complete any remaining repairs needed on the concrete base around each of the vent manhole structures. Conduct an internal inspection.

Cedar Street Reservoir: Perform an inspection in 2013 and provide us with a copy of the inspection report.

DISTRIBUTION**Interconnections with Other Supplies**

Is water purchased from other supplies? (Y/N)

Yes

If yes, list WSSN number (s):

DWSD

1800

No. of Emergency Connections:

Location	Main Size	Est. Capacity	Metered?
C.S. 1	72"	>70 mgd	Yes
Flint & GCDC conn. via Flint			
Donaldson St	12"	*	Yes
Person & Clio	not conn	not used	Na
Carpenter and Clio	12"	not used	Na
Carpenter and Bray	12"	not used	Na
Van Slyke Rd	24"	not used	Na
Richfield	12"	not used	Na
Woodrow and Center	8"	not used	Na
East Atherton	12"	not used	Na
Miller and Ballenger	8"	not used	Na
Gen Co. Conn prior to Flint			
S. Genesee Pit	30"	13.2 mgd	Yes
Vassar Rd	12"		Yes
Irish Rd N	18"		Yes
Irish Rd S	18"		Yes
Belsay Rd	18"		Yes
M-15 N	24"		Yes
M-15 S	24"		Yes
Oak Rd S	18"		Yes
Oak Rd N	18"		Yes
Henderson S	12"		Yes
Henderson N	42"		Yes
Center Rd. N	18"		Yes
Branch Rd N	12"		Yes
N Genesee Rd	12"		Yes
Francis Rd	12"		2-way

If emergency, are valves exercised annually?

(Y/N)

Recc.

Flushed?

(Y/N)

Recc.

Comments:

Out going meter pits from the city's west side.

* Water can exit Flint's distribution system to Genesee county at the Houran St. Pumping station (Donaldson St.) near Beecher Rd on the city's west side. This connection or alternate feed to Genesee County is no longer used since Genesee has completed their North Loop system and the Henderson Road pumping station.

Water can also exit Flint's distribution system at the Orgould Avenue pumping station; however, this facility is is not operational.

Emergency interconnection valves should be operated periodically to maintain ability to operate. Any dead-end piping should also be flushed prior to emergency use.

Distribution Piping

Mains by Material	
Cast Iron	70%
Ductile Iron	20%
PVC	0%
Asbestos-Cement	0%
HDPE	0%
Concrete	2%
Steel	8%

Mains by Size	
2"	0%
4"	3%
6"	51%
8"	24%
10"	0%
12"	8%
14"	to be det
16"	1%
18"	2%
24"	4%
30"-48"	1%

Mains by Age		
to	years	
to	years	
to	years	
to	years	
to	years	
to	years	
to	years	

Estimated percent of piping with coal tar lining 0%

Comments: The percent mains by material and size is based upon the 2011 Water Reliability Study.

The majority of Flint's distribution system consists of cast-iron and ductile iron piping up to 24" main sizes. The percentage of cast iron and ductile iron mains are not known at this time. The majority of the larger transmission mains (>24") consists of steel and concrete piping.

The city has replaced watermain since 2000, however, the overall shift in percentages has not been determined. Specific replacement projects are listed on Pages 3 and 4 of the review.

The city retained Rowe Incorporated to prepare a water system reliability study. Phases I and II of the study are completed and include a list of recommended distribution system and transmission system improvements (Appendix B). Our review comments were provided to the city and Rowe in November of 2012 for the Phase II report. Rowe's response to our comments is pending.

DISTRIBUTION**Operational Concerns & Maintenance**

Are there areas where water main breaks are frequent? (Y/N) Many areas

If yes, identify locations:

west side transmission loop - 24-inch steel main
Fenton Rd
Atherton Rd
Dort Hwy
Averil St
Leslie
Gracelawn
Boulevard Drive

Comments: Main breaks also occur in many other areas of the city, however, the most frequent breaks occur in the areas listed above. The WSC has responded to approximately 760 watermain breaks from 2009 to date. WSC staff are utilizing City Point software in conjunction with GPS to track main breaks and as part of an asset management tool.

Are there areas where aesthetic water quality complaints are frequent? (Y/N) No

Comments: In general, water quality complaints are not received. Occasional complaints do occur from unanticipated flushing following street sweeping work and those associated with watermain repairs.

Do you receive complaints alleging illness due to the water? (Y/N) No

Is a procedure in place to respond to and track these complaints? Yes

Comments: All complaints are addressed by conducting additional water quality testing. Collection and analysis of samples are performed by WTP lab staff.

Are there areas where customers complain of low pressure? (Y/N) Yes

Comments: Some low pressure complaints have been received in the residential areas between MLK Blvd. and Welch and in the DuPont & Pasadena corridor.

Are there areas where peak flows (including fire flow) cannot be maintained? See Phase 2 of Reliability Study

Comments: The condition of the west transmission system limits fire protection. Phase II of the reliability study is expected to depict specific areas of the system not capable of providing adequate fire protection flow while maintaining the minimum 20 psi system pressure

Last ISO rep 2008 Rating _____

Proposed distribution system improvements:

Phases I and II of the reliability study recommends a 6-year CIP for distribution system improvements.

CIP consists of 2 pumping station projects, 5 major transmission system projects, and 6 minor transmission system projects. The Phase II study outlines other capital improvement projects that should be completed over the next 20 years.

MDEQ Conclusions/Recommendations

Flint's water system consists of over 500 miles of distribution and transmission mains. Our main concern with Flint's water system continues to be the condition of the piping. Although the city has replaced approximately 12 miles of watermain over the past ten years, much of the remaining piping is over 60 years old and in need of replacement. Also, this rate of watermain replacement (1.2 miles per year - average) results in a total replacement rate of over 400 years. The typical water distribution replacement rate needs to be 100 years or less.

Next, the WSC has repaired over 750 watermain breaks from 2009 to date. Finally, the condition of the west transmission system limits the ability to provide adequate fire protection in the MLK Blvd, Welch, DuPont, and Pasadena corridor. This area has also noted for receiving low pressure complaints.

The city retained their consultant to update their water system reliability study and the first two phases of the study have been completed. The updated reliability study also arrives at the same conclusion that much of the system is in need of replacement. The Phase I study identifies major and minor transmission improvement projects and incorporates these projects into a 6-year capital improvement plan. The second phase of the study discusses Flint's 20-year needs and outlines potential capital improvements over the next 20 years. The second phase also outlines a hydrant replacement program. Finally, the second phase outlines the development of an asset management system.

The city needs to continue making water system improvements and include the projects listed in the 6-year capital improvement plan; however, the city must also develop an adequate water rate structure to ensure that these capital improvements are funded. An important objective in the second phase of the reliability study is the development of an asset management program that will play a key role in assisting the city to establish an adequate rate structure. The city needs to continue working with their consultant towards establishing an effective asset management program and an on-going water system capital improvement program.

We are requesting that the city respond to us as to how they plan to correct the distribution system deficiencies. Critical steps need to include; identifying an adequate rate structure, developing a prioritized capital improvements plan, and a establishing a timeline by which these objectives and major projects are completed.

DISTRIBUTION**Pump Stations**

Location: Cedar Street
 Function: Provide supply from 20 MG Cedar St reservoir during peak demand

Pump Number	1	2	3
Year Installed	1948	1948	1948
Type	centrif	centrif	centrif
Permit Capacity			
Permit TDH			
Current Capacity	8 mgd	12 mgd	15 mgd
Basis	flow meter	flow meter	flow meter
Current TDH	160'	160'	160'
HP	500	350	350
Last Complete Inspection	All pumps receive maintenanc insp. annually - most recent 2/4/13		
Last Efficiency Test			
Control signal Type	Varies between analog and digital		
Controls Adequate?	ye	yes	yes
Operator Visit Frequency	daily	daily	daily

Auxiliary Power

Power Type	NONE	Power Rating (kWh)	
Fuel Type		Starting Freq.	
Total Pump Capacity	35 mgd	Load Test Freq.	
Firm Pump Capacity	20 mgd		
Auxiliary Power Capacity			

Max Day Demand @ this location		mgd
Peak Hour @ this location		gpm
Avg Day Demand @ this location		1 mgd

Firm Pump Capacity/Max Day		%
Peak Hour/Firm Pumping Capacity		%
Aux. Power Capacity/Avg Day		%

Comments:

The Cedar Street pumping station consists of three single stage horizontal centrifugal pumps that takes suction from an adjacent 20 mg reservoir. This station is used as a peaking facility and the reservoir is re-filled during low demand periods. Pump operation and filling of the reservoir is controlled at the WTP or manually at the booster station. Pump operation set points are located within the distribution system.

Two of the existing cone valves were replaced with 14" pump control valves for pumps 2 and 3. Butterfly valves were also installed on the discharge side of all three pumps. Pump 1 is still controlled by the existing cone valve which still performs satisfactorily. Pump motors #1 and #2 were recently re-wound. The chlorine feed system has been removed from the pump station.

The average day demand through this station is determined by the amount of water taken from the storage reservoir. The station operates on a pump and fill cycle and alternates with the westside pump station on an every other day basis. This station is capable of metering total pumpage on a daily basis. The pump status is relayed via the SCADA system to the operations center. Daily pumpage is estimated and is recorded on the daily sheets.

The electrical controls and switchgear, late 40's vintage, remain outdated and most of the replacement parts are no longer available. A complete rehabilitation of the electrical system is proposed for the Cedar Street station and a construction permit has been issued for the project; however, the city has not proceeded with the work due to lack of adequate funding.

Pump maintenance consisting of lubrication and inspection is conducted once a month on all pumps at all of the booster pumping stations. Each pump is operated at least once a month. The pump station is well maintained and the housekeeping is above average. A detailed pump inspection including a pump efficiency test has not been performed within the past five years and is recommended. Chlorine monitoring is done at the suction header pipe.

Westside Pumping Station (P.S. No. 5)

Location: Westside
 Function: Provide supply from an adjacent 12 mg reservoir during peak demand.

Pump Number	1	2	3	4
Year Installed	1970	1970	1970	1970
Type	turbine	turbine	turbine	turbine
Permit Capacity				
Permit TDH				
Current Capacity	4 mgd	4 mgd	8 mgd	8 mgd
Basis				
Current TDH	142'	142'	142'	142'
HP	100	100	200	200
Last Complete Inspection	All pumps receive maintenanc insp. annually - most recent 2/4/13			
Last Efficiency Test				
Control signal Type	Varies between analog and digital			
Controls Adequate?	yes	yes	yes	yes
Operator Visit Frequency	daily	daily	daily	daily

Auxiliary Power

Power Type	None	Power Rating (kWh)	
Type		Starting Freq.	
Total Pump Capacity	24 mgd	Load Test Freq.	
Firm Pump Capacity	16 mgd		
Auxiliary Power Capacity			

Max Day Demand @ this location _____ mgd
 Peak Hour @ this location _____ mgd
 Avg Day Demand @ this location _____ 1 mgd

Firm Pump Capacity/Max Day _____ %
 Peak Hour/Firm Pumping Capacity _____ %
 Aux. Power Capacity/Avg Day _____ %

Comments:

The Westside pumping station consists of 2 three stage turbine pumps and 2 two stage turbine pumps that take suction from an adjacent 12 mg reservoir. The station serves as a peaking facility and the reservoir is re-filled during low demand periods during the winter months. During the summer months the station operates on a continuous pump and fill cycle and the operation alternates every other day with the Cedar Street station. Pump operation and filling of the reservoir is controlled at the WTP or manually at the booster station. Pump operation set points are located within the distribution system. The reservoir typically operates between 13 and 16 feet of water elevation.

Daily pumpage is recorded on the daily operations sheet; the Westside station is not metered; however the calculation of the number of feet dropped in each reservoir is performed daily at 12am and used to determine pumpage at Westside. Chlorine monitoring is performed at the suction well.

Modifications to the pump-discharge valving is needed. The existing 4 mgd pumps are equipped with spring check valves. This design causes rapid valve operation during pump start-up and bumps the distribution piping downstream and most likely contributes to the main breaks in this area. The larger pumps are equipped with cone control valves. Although these are currently working, they had a history of operational problems at the pump station.

WSC staff are installing an air-shock pressure bladder on the booster station's main discharge line as a means to address main breaks in this area. A chlorine residual monitoring point is also being added to monitor the chlorine residual in the reservoir.

The chlorine feed system has been removed from the pump station.

Pumping Station No. 4 (P.S. No. 4)

Location: P. S. #4
 Function: Provide supply from 20 mg reservoir and 3 mg well during peak demand.

	<u>1</u>	<u>2</u>	<u>7</u>	<u>8</u>	<u>9</u>
Pump Number	<u>1</u>	<u>2</u>	<u>7</u>	<u>8</u>	<u>9</u>
Year Installed	<u>1949</u>	<u>1949</u>	<u>1994</u>	<u>1994</u>	<u>1994</u>
Type	<u>turbine</u>	<u>turbine</u>	<u>turbine</u>	<u>turbine</u>	<u>centrif</u>
Permit Capacity					
Permit TDH					
Current Capacity	<u>20 mgd</u>	<u>25 mgd</u>	<u>20 mgd</u>	<u>20 mgd</u>	<u>6 mgd</u>
Basis	<u>flow meter</u>	<u>flow meter</u>	<u>flow meter</u>	<u>flow meter</u>	<u>flow meter</u>
Current TDH	<u>185'</u>	<u>185'</u>	<u>185'</u>	<u>185'</u>	<u>185'</u>
HP	<u>800</u>	<u>1000</u>	<u>800</u>	<u>800</u>	
Last Complete Inspection	<u>All pumps receive maintenanc insp. annually - most recent 2/4/13</u>				
Last Efficiency Test					
Control signal Type					
Controls Adequate?					
Operator Visit Frequency	<u>daily</u>	<u>daily</u>	<u>daily</u>	<u>daily</u>	<u>daily</u>

Auxiliary Power

Power Type none - dual electrical feeds to WTP Power Rating (kWh) _____
 Fuel Type _____ Starting Freq. _____
 Total Pump Capacity _____ mgd Load Test Freq. _____
 Firm Pump Capacity _____ mgd
 Auxiliary Power Capacity _____ mgd

Max Day Demand @ this location _____ mgd
 Peak Hour @ this location _____ mgd
 Avg Day Demand @ this location _____ mgd

Firm Pump Capacity/Max Day _____ %
 Peak Hour/Firm Pumping Capacity _____ %
 Aux. Power Capacity/Avg Day _____ %

Comments:

Pumps 7,8, and 9 are in good operating condition. Pump #9's main purpose is to recirculate water in the 3 Mgal well. Pumps #1 and #2 remain in-operable; thus the total and firm pumping capacity of the station remains at 46 and 26 MGD respectively. WTP staff are discussing with the city the possibility of replacing Pumps #1 and #2 with new pumps of lower capacity.

Chlorine monitoring is collected from a sample tap representative of water from the middle of the 3MGAL well.

Pump Station #4 was also rehabilitated in 1994. The project consisted of two 20 mgd pumps and one 6 mgd pump to improve turn over in the 20 mg Dort reservoir. The project also included installation of a second 42" discharge line.

A stand-by power generator exists but is not capable of providing sufficient power. Dual electrical feeds are provided for the WTP site and include P.S. #4; however, the dual feeds emminate from one main electrical grid.

Torrey Road Pumping Station

Location: Torrey Road
 Function: Boost pressure to the SW portion of the city including Hospital Hill

Pump Number	<u>1</u>	<u>2</u>	
Year Installed	<u>1954</u>	<u>1954</u>	
Type	<u>centrif</u>	<u>centrif</u>	
Permit Capacity			
Permit TDH			
Current Capacity	<u>2.8 mgd</u>	<u>4 mgd</u>	
Basis			
Current TDH	<u>65'</u>	<u>100'</u>	
HP	<u>40</u>	<u>125</u>	
Last Complete Inspection	<u>All pumps receive maintenanc insp. annually - most recent 2/4/13</u>		
Last Efficiency Test			
Control signal Type			
Controls Adequate?			
Operator Visit Frequency		<u>1/day</u>	

Auxiliary Power

Power Type	<u>None</u>	Power Rating (kWh)	
Fuel Type		Starting Freq.	
Total Pump Capacity		Load Test Freq.	
in Pump Capacity			
Auxiliary Power Capacity			

Max Day Demand @ this location		mgd
Peak Hour @ this location		mgd
Avg Day Demand @ this location		mgd

Firm Pump Capacity/Max Day		mgd
Peak Hour/Firm Pumping Capacity		mgd
Aux. Power Capacity/Avg Day		mgd

Comments:

The Torrey Road station functions an in-line booster pump station and takes suction form a 24" trans. main along Hammerberg Rd. This station boosts pressures in the SW portion of the city; however, the extent of the pressure district is not clear. The station operation is controlled by a pressure monitor located at Brown & Bradley Street and is transmitted back to the pump station and the operations center at the WTP. Operation of the station is controlled manually from the WTP. The station is operated when the line pressure at Brown & Bradley drops below 45 psi - usually at night when the Cedar Street and/or Westside Reservoirs are re-filling. Pump #2 is not used due to its high discharge head. A new, smaller pump or a variable frequency drive is needed at this facility for more reliable and efficient operation.

Improvements to the pump station are planned for 2013 and a construction permit has been issued for the work. The project will include replacement of both pumps, new piping and valving, and provisions for stand-by power.

EQ Conclusions/Recommendations:

All of the pumping stations are well maintained and the housekeeping is above average; however, pump availability, valving and electrical controls, switchgear, and stand-by power are pump station deficiencies that need to be corrected. Although the city has attempted to finance improvements at the Cedar Street and Torrey Road stations with Drinking Water Revolving Funds (DWRF) and a construction permit was issued, these projects did not proceed due to the city's current bond debt.

While we understand the financial constraints that the city is encountering to secure financing for these projects; however, the condition of the Cedar Street and Torrey Road station and their limited operating reliability will remain a concern until they are corrected. The need to replace Cedar Street's station's outdated electrical switchgear and provide stand-by power has been a long-standing issue. Next, the Torrey Road pump station has only one reliable pump for operation and this facility plays an important role in providing adequate water service to the western portion of the city including the Hospital Hill area. Stand-by power is also needed at the Torrey Road pump station.

It is our understanding that the city will proceed with an upgrade of the Torrey Road station in 2013 including replacement of the oversized pump, variable frequency drive control, new piping and valving, and provisions for stand-by power. It is also our understanding that adequate funds are in place to complete the improvements at Torrey Road. The city needs to proceed with and complete the work needed at this station.

Finally, we are requesting the city, by no later than June 1, 2013, to propose a timeframe by which the electrical improvements and standby-power provisions can be completed at the Cedar Street station.

DISTRIBUTION**Hydrants**

Number of Hydrants	<u>3909</u>
Number <u>Without</u> Auxiliary Shut-Off Valves	<u>not aware of any</u>
Number that are Self-Draining	<u>>90%</u>
Number of Inoperable Hydrants	<u>18</u> **

Frequency of Hydrant inspection: 1/yr (fall)

Inspection Staff: L18 Maintainers L19 Equip. Ops.
Dist. Foreman

Comments: All replacement hydrants are ordered plugged, however, a few are unplugged.
 ** The number of inoperable hydrants is always changing. Hydrants that are found in a state of disrepair are usually repaired within one week.

WDD operators have replaced a significant number of deficient hydrants over the past several years, including thirty 4-inch hydrants in 2012.

Are there areas where additional hydrants are needed? some areas

The WDD would like to establish a 300-500' hydrant spacing standard.

Hydrant location system Yes Accurate? yes

Records depicting hydrant blueprints and cards are in place and appear to be accurate.

Are hydrants color coded for capacity? yes, but not consistent

Hydrant caps are coded by main size; however, this coding system is not consistent. Hydrants also need to be re-painted.

Has this information been provided to the fire department? Improved communication needed

Frequency and seasons of hydrant flushing 1/yr (fall)

Hydrants are flushed once a year during the fall. Flushing is performed to maintain water quality and to maintain hydrants. WDD targets dead-end watermains for flushing during the summer months.

Purpose of flushing aesthetics

Is the public notified prior to flushing? Yes - via local news

Does flushing follow a specific format? yes

Flushing is set-up on a per grid basis with 50-100 hydrants per grid. Usually one operator is assigned to a grid. There is no order in which the grids are flushed. Directional flushing is not conducted due to limited staffing and need to operate isolation valves in order to directionally flush. Hydrants are flushed full and until they run clear. As water usage continues to decline, more frequent flushing may be needed to maintain aesthetic water quality.

Is the volume of water used during flushing estimated? No

Is a record maintained of hydrant activities? Yes

Hydrant records and work orders are maintained and the WDD has established an accurate hydrant database.

All hydrants are included on individual water system maps and they are entered on a database system that prints maps as needed. Specific information about each hydrant is also contained. Hydrant cards and work orders are also maintained and this information is updated in the database system.

The fire department is informed about inoperable hydrants and updates on the status of these hydrants has improved. The WDD also needs to inform the fire department regarding which hydrants are difficult to operate yet functional. The fire department may conclude that many of these hydrants are totally in-operable. The WDD needs to continue to maintain good communication with the fire departments on hydrant status and to refresh proper hydrant operation.

The WSC allows contactors to use system hydrants provided that they rent a hydrant meter and backflow preventer device from the WSC. WSC staff also set the meter and backflow preventer device to insure proper operation. The WSC is looking to installing a filling station at the WSC to make purchasing of water by contractors more convenient.

MDEQ Conclusions/Recommendations

The WDD is maintaining an adequate hydrant program; however, it appears that some improvement in communication between the WDD and the fire department concerning color coding and the condition of hydrants are needed. It is also important to verify that fire department staff are familiar with the procedures of opening and closing hydrants. Finally, the WDD should work at estimating the volume of water being used during flushing. This will help to determine the component of unaccounted water due to flushing.

DISTRIBUTION**Valves**Number of Valves 7,258 2011 Reliability StudyNumber of inoperable valves manyAre there areas where additional valves are needed? yes

If yes, list locations:

Along Saginaw St and many other areas

The WDD indicated that many of the city's valves do not work and has resulted in larger than necessary interruptions in water service to make the necessary repairs.

Valve location system partial system Accurate? yesValve Turning Frequencies no program in place

Comments:

The reason given for the continued lack of a valve turning program is an insufficient number of operators to perform the work and insufficient equipment. Operators have a GPS controlled valve turning machine; however, a reliable vehicle is needed to transport the machine.

Records Maintained? approx. 70% adequate records of distribution system valves.

The city has received community block grant funds over the past several years to be utilized for hydrant and valve replacement. Approximately \$100,000 was received in 2012 which allowed for replacement of approximately 30 hydrants. The city anticipates receiving \$140,000 in CBG funds in 2013 and the funds will be used for valve replacement.

MDEQ Conclusions/Recommendations

The city's valve program has improved; however, deficiencies still need to be resolved. Although accurate valve records have been established for nearly 70% of the valves, a turning program needs to be implemented. The WDD; however, needs to acquire a more reliable vehicle to transport their valve turning machine in order to implement valve turning. Phase II of the reliability study provides a good strategy towards implementing an effective valve turning program. Although it would not be possible to turn all system valves on a yearly basis, an exercising schedule should be established especially for valves in critical locations. The city should strive at turning a certain percentage of valves each year such that all valves are turned over a five to ten year time period. The city needs to implement these strategies and eliminate the barriers that are inhibiting the WDD from establishing an effective valve program.

DISTRIBUTIONCustomer Service Information

Number of service connections	app. 32,900
Number of metered service connections	31,228 residential
	1,671 commercial
Identify service line materials and estimate percentages:	
Copper	10%
PVC/PE/PB	none
Galvanized	10%
Lead	80%
	(CWS/Customer)
Ownership of Service	
From Corp Stop to Curb Stop	City
From Curb Stop to Property Line	Customer
From Property Line to Meter	Customer
Meter	City

Customer Meters

Types of meters Used	Metron & Badgers
Number of Meters with Touch Pads or Other Remote Reading Devices	99%
Size of Meters	Varies
Residential	5/8 -in to 4-in
Industrial/Commercial	5/8-in to 8-in
Meter Testing/Maintenance Program	limited
Average Age of Meter in System	Res. - 7 yrs
Residential/Commercial/Industrial	4 yrs
Criteria for Changeout	failed - cust pays
Number or Percent Changeout per Year	approx. 300
Master Meter Locations	eleven
Calibration of Master Meters	Genesee County
Meter Reading Staff/Contract:	WDD Staff

Comments:

The WDD has a large percentage of Badger meters with transponders that are expected to fail soon and will need to be replaced. These meters are replaced on an as-needed basis and are coordinated in conjunction with other work needed at the given location. The city keeps track of all active accounts including the number of second meters serving multiple housing units and/or irrigation meters as well as non active accounts including water shut offs.

Pumpage Distribution

% Residential	24.00%	
% Lg. Commercial & Indust.	76.00%	
% Lg. Users - List	7.00%	GM Truck
	< 1%	Delphia
	1.00%	Hurley Med. Ctr.

DISTRIBUTION**System Growth**

Year	No. of Residential Meters Installed	No. of Comm./Industrial Meters Installed	No. of Construction Permits Issued	Permitted Amount of WM Feet
2002				
2003	none	none		
2004	none	none	2	WM Repl
2005	none	none	2	WM Repl
2006	none	none	2	WM Repl
2007	none	none	4	WM Repl
2008	none	none	2	WM Repl
2009	none	none	2	WM Repl
2010	none	none	2	WM Repl
2011	none	none	1	WM Repl
2012	none	none	2	WM Repl

Water Rates

What is your current rate schedule?

see comment

Are current rates adequate to support O&M and CIPS?

see comment

When was last time rates were adjusted?

2012

Has a water rate study been performed? When?

Being conducted with Genesee County

Is there a meter charge or ready to serve charge?

Yes - based on size

Is a copy of the water rate schedule and ordinance available?

Yes

Comments:

Water rates are \$7.52/100 CF for the first 3,500 CF, \$7.31/100 CF for the next 196,500 CF, and \$5.79/100 CF for any usage above 200,000 CF. In addition to the consumption rate, the remote and non-remote meter monthly charge is \$21.78 and \$26.33 respectively. A copy of Flint's water rate schedule is in Appendix C.

Since 2000 there has been a steady decline of residential, commercial, and industrial customers. Although the city acquired a few new customers, the city's population has declined by over 20,000 between 2000 and 2010. Construction permits issued in Flint have been for watermain replacement projects as opposed to serve new development. Specific projects are summarized in the Construction Permits section.

MDEQ Conclusions/Recommendations

The city of Flint is required to provide adequate Financial Capacity and demonstrate this capacity to the MDEQ. Flint's water rate schedule and method of collection must be adequate to allow for water system capital improvements and to maintain important water system operation and maintenance programs. Current lack of Financial Capacity is evident based on the deficiencies in various water system O&M programs attributed to the lack of funding to provide proper equipment and/or sufficient staffing to maintain program objectives. As we discussed, Flint needs to proceed with an asset management program as recommended in the second phase of the 2011 Reliability Study. Completion of asset management will help the city to determine an adequate rate structure and collection methodology to support both an active O&M and CIP programs.

Repair Parts Inventory

Extra Mains (Sections for Each Size in Service)

Avail up to 48-inch

Repair Clamps (2 or more for each size)

Yes

Tees, Crosses & Elbows

Yes

Hydrants

Yes

Valves

Yes

Services (Corp & Curb Stops, Clamps and Lines)

Yes

Other

see comment

Safety Issues

Confined Space Entry Program in Place % Followed (Y/N)

Yes

Trench Safety Program in Place & Followed (Y/N)

Yes

Comments:

The WSC must purchase their spare parts from local vendors who provide the inventory in the WSC's stockroom. WSC staff have 24-hour access to repair parts and parts are purchased from the stockroom with a city issued credit card. The purchasing process has improved somewhat; however, is still somewhat cumbersome.

PROGRAM COMPLIANCE**Cross Connection Control Program (CCCP)**

Ordinance No. 3712 Sec. 46-34 & 46-35 Date: 6/12/2008
 Approved Program (Y/N)? Yes Date: _____
 Staff Assigned to Program, (No., Dept. and/or who) Utilities Cross Connections Division (UCCD)
 Is Annual Cross Connection report required (Y/N)? Yes
 Was previous year's annual report received (Y/N)? Yes Date Received: 2/29/2012
 Was previous year's annual report acceptable (Y/N)? Yes
 Inspection Status: Acceptable implementation
 Assembly Testing Frequency 1-2x/yr. (high hazard) 1x/yr. (mod. and low had)
 Assembly Testing Perform. _____
 Recordkeeping: Database program
 Private Well Isolation/Abandonment Procedure: _____
 Comments:

The UCCD has maintained adequate implementation of the CCCP. Mr. Glen Thomas continues to conduct cross connection inspections at all (approx. 300) of the high hazard accounts each year. There has been an overall reduction in the number of eligible cross connection accounts due to the city's shrinking customer base. The loss of Delphi East and West and the Buick City site has contributed to the shrinking number of accounts eligible for routine cross connection inspections. As of 2011 there were approximately 2,000 low hazard accounts and approximately 600 of these accounts are inspected each year. Low hazard accounts are scheduled to be inspected once every three to five years. RPZ device testing is also performed and approximately 75% of the 1,200 testable devices are tested on a yearly basis. Based upon the survey, the city is meeting the 1-year and 3-year objective for device testing.

Recordkeeping is adequate and consists of a database that lists each account by their degree of hazard.

MDEQ Conclusions/Recommendations

The city is maintaining adequate implementation of their CCCP and are completing a sufficient number of low and high hazard inspections each year. It appears that additional clerical assistance is needed for recordkeeping, reporting, and maintaining the CCCP inspection schedules. We encourage the city to review the CCCP's workload to further determine the need for additional assistance.

Finally, although an acceptable CCCP is being maintained for the commercial and industrial customers, the city will need to expand their CCCP to include inspections of residential accounts. Part 14 of Act 399 prohibits cross connections and requires public utilities to have a formal program in place to control them. There is no differentiation in the rules between residential and other customer types. A guidance document was provided to Mr. Thomas on how to implement this important program on the residential level. We ask that this document is reviewed and utilized towards developing a strategy to implement residential cross connection control. We will also discuss expansion of the CCCP to include residential customers during future water system inspections.

Annual Pumpage Reports

Is Annual Pumpage Report required (Y/N)? No
 Was previous year's report received (Y/N)? yes

Monthly Operator Reports (MORs)

Are Monthly Operation Reports required (Y/N)? Yes
 Were all previous year's reports received (Y/N)? Yes Timely? Yes
 Are previous year's reports acceptable (Y/N)? Yes

MDEQ Conclusions/Recommendations

The WTP staff are responsible for preparing the MORs and the routine MOR is acceptable. WTP staff also prepare an operation report for each routine test run and emergency operation. The test run reports include all of the critical treatment plant operating parameters; however, the emergency operation reports needs to include the average, maximum, and minimum values for these treatment parameters.

Consumer Confidence Reports

Is the annual CCR required? (Y/N) Yes
 Was the previous year's report received? (Y/N) Yes Timely? yes
 Was the previous year's acceptable? (Y/N) Yes
 Was the previous year's certification form received? (Y/N) yes Timely? yes

Comments: A copy of Flint's most recent CCR and water quality data can be found in appendix D.

PROGRAM COMPLIANCE**Emergency Response Plan (ERP)**

Date of Most Recent Plan: 2013 Acceptable? see comments
 Filed where? WTP

MDEQ Conclusions/Recommendations

WTP staff have prepared a water system ERP (draft). The draft ERP discusses the 72-inch pipeline emergency and coordination with Genesee County. Much has been learned in the past five years with regards to emergencies on the pipeline and emergency operation of the stand-by water treatment plant (WTP). The loss of service on the basis of a total shut-down (both Flint and Genesee County being impacted) includes the provision to provide Genesee County with 8.0 MGD of treated Flint River water by back-feeding the 72-inch transmission main.

Other required information including: contacts, critical customers, communications, contractors, and suppliers are provided.

The ERP needs to be updated further to discuss the various plans and agreements (type and location) that are in place to help mitigate water related emergencies. This includes; water system general plan, safety plans, water quality monitoring plans, and mutual aid agreements. All master meter locations and emergency interconnections also need to be listed in the ERP.

Finally, the ERP includes a discussion of emergency chlorination procedures for contamination of water storage reservoirs and distribution system piping. The procedure references the use of swimming pool chlorine to be used for disinfection. The use of swimming pool chlorine cannot be used for water system disinfection unless the compound is an ANSI/NSF Standard 60 approved product. The ERP needs to be revised to confirm that

General Plan

Date of Most Recent Plan: 1991 Acceptable? See comments
 Filed Where? Water Service Center

General Layout	<u>needs updating</u>
Facilities locations & capacities	<u>yes</u>
Watermain Inventories	<u>yes</u>
Id of Service Areas	<u>yes</u>
Hydraulic Analysis	<u>yes</u>
CIP	<u>yes</u>

Comments:

The most recent general plan containing distribution system info was prepared in 1991 and is outdated. The WSC also has a series of more detailed maps (120 smaller maps) of the distribution system. Finally, the city has a hydraulic network model of the transmission piping that was prepared as part of the reliability study. Although, this model will be useful for modeling the water system for future extensions and/or water system studies, the general plan needs to be updated.

Reliability Study

Date of Most Recent Study: 2010 -2012 Acceptable? Phase I - yes
City, MDEQ Phase II - MDEQ comments provided

5 & 20 Year Demand Projections	<u>yes</u>
Source Prod. Totals (Monthly)	<u>yes</u>
Customer Supply Usage (Annual)	<u>yes</u>
Res/Comm/Ind Usage (Annual)	<u>yes</u>
Water Shortage Response Plan	<u>no</u>
Recommended Improvements	<u>yes</u>

Comments:

The city retained Rowe Incorporated to perform a water system reliability study. Phase I was completed in 2010 and included an updated hydraulic model of the distribution system along with the establishment of a 6-year capital improvements program. Phase II (draft) was available late in 2012 and focused on the 20-year capital improvements program and included distribution, transmission, and pumping station improvements. Development of necessary rate structures to operate and maintain the water system and a preliminary asset management plan were also included with the Phase II study. The MDEQ provided comments to the Phase II study.

MDEQ Conclusions/Recommendations

Our comments/questions to the second phase of the reliability need to be answered such that the reliability study can be approved. As part of the approved study, the city's 1991 water system general plan needs to be updated and a working copy be made available for WSC and WTP staff.

Next, the city will need to complete the projects in the 6-year CIP, maintain an on-going CIP by 2016 and beyond, and establish an asset management program. We will discuss the 2016 requirements for the CIP and asset management program in more detail in future during future site visits.

Permits

Applies for and obtains permits prior to construction (Y/N):	<u>Yes</u>
Reviews plans from engineers and/or developers prior to submittal to DEQ (Y/N):	<u>Yes</u>
Standard specifications on file at CWS (Y/N):	<u>Yes</u>
If applicable, adheres to contract with supplier regarding plan submittal (Y/N):	<u>NA</u>
Follows master plan for any construction (Y/N):	<u>NA - no current master plan</u>
Actually follows plans as permitted (Y/N):	<u>Yes</u>
Develops as-built plans (Y/N):	<u>Yes</u>
Updates general plans (Y/N):	<u>No</u>

MONITORING**Bacteriological**

Date of Approved Site Sampling Plan :	<u>Dec. 2012</u>
Are samples still being collected in accordance with the plan? (Y/N)	<u>Yes</u>
Number of samples required each month:	<u>100</u>
Basis for Setting Number of Monthly Samples:	<u>Population</u>
Certified Lab Used:	<u>Flint WTP Lab</u>
MCL, Monitoring or Reporting Violation(s) in past 3 years?	<u>No</u>
Number & Type of Violations	<u>None</u>
Public Notice Issued according to regulations? (Y/N)	<u>NA</u>

Comments: The city continues to update the sample site plan due to constant changes in their routine sampling locations. A revised plan is sent to us following any changes. Distribution system chlorine residuals are taken during routine bacteriological sampling. A monthly and yearly average for free and total chlorine residual is maintained. Chlorine monitoring is also conducted at each pump station.

Chemical - DWSD purchased water; thus much of the monitoring is not required

Date of Monitoring Schedule:	<u>2/17/2013</u>
Are samples still being collected in accordance with the schedule? (Y/N)	<u>Yes</u>
Were nitrate, nitrite and fluoride (or partial chemical) samples collected? (Y/N)	<u>NA</u>
If nitrate detect, what is concentration?	
If nitrite detect, what is concentration?	
Detects for metals > 50% of MCL? (Y/N)	<u>NA</u>
Metals (list)	
Detects for VOCs (Y/N)	<u>NA</u>
Detects for SOCs (Y/N)	<u>NA</u>
Date of Approved Stage II Disinfection Byproduct Monitoring Plan :	<u>4/24/2012</u>
Stage II DBP Sampling Done? (Y/N/Waived)	<u>Yes</u>
If yes, done to site sampling plan? (Y/N)	<u>Yes</u>

Lead and Copper Monitoring

No. of Samples Required:	<u>23</u>	
Semi Annual/Annual/Triennial	<u>Triennial</u>	
Exceedance of lead or copper action level (Y/N)	<u>No</u>	
If yes, was public education issued (Y/N)	<u>na</u>	Date Issued:
Next Monitoring Period:	<u>6/1/2014 - 9/30/2014</u>	
Corrosion Control Program, if applicable	<u>NA</u>	
Lead service line replacement status, if applicable	<u>NA</u>	

Comments:
The city has adequately implemented their lead and copper monitoring program. The city participates in the modified consecutive system plan with Detroit which allows for a reduction from the full chart value of 100 sampling points to 23 points once per monitoring period.

Radiological Monitoring - Not required since Flint purchases water from Detroit

Distribution System Sanitary Survey Summary

1. Designate a distribution system back-up operator holding an S-4 (or higher) certification - Page 2
2. Perform an inspection of the 3 Mgal Well and, if needed, complete repairs on concrete base around each manhole vent - Page 7
3. Complete an inspection of the Cedar Street reservoir and provide us with a copy of the inspection report - Page 7
4. Establish a schedule for completing the 6-year capital improvements program that is presented in the reliability study - Page 4.
5. Proceed with and complete the improvements needed at the Torrey Road pump station - Page 16
6. Propose a schedule for completing the electrical improvements/stand-by power provisions at the Cedar Street pump station - Page 16
7. Maintain adequate communication between the Water Distribution Division and the fire department concerning the condition of hydrants and the color coding system - Page 18
8. Begin estimating the volume of water used for flushing - Page 18
9. Correct valve program deficiencies - purchase necessary equipment, acquire/train additional operators, and implement a valve maintenance program - Page 19
10. Review the Cross Connection Control Program workload and, as needed, provide additional program assistance - Page 22
11. Expand the scope of the WTP test run reports to include the average, maximum, and minimum values for the reported treatment parameters - Page 22
12. Update the draft Emergency Response Plan (ERP) to address our comments. Remove wording from the draft ERP that calls for use of pool chlorine for water system disinfection during emergencies - Page 23
13. Prepare a final copy of the water system Reliability Study - Phase II which addresses our review comments - Page 24
14. Update the 1991 water system general plan - Page 24.

APPENDIX A

WSC Organizational Chart

APPENDIX B

Recommended 6-year CIP

Table 1: 6-Year Capital Improvement Table

Project Number	Capital Improvement Program	Design Status	Construction Status	2010 Construction Costs	Contingencies, Engineering, Management and Legal (CEM&L @ 47%)	Total CIP Project Cost
	Major Booster Station Improvement Projects					
Project 1	Torrey Road Booster Upgrades (In-house)	Design Complete	Construct 2010	\$300,000	\$141,000	\$441,000
Project 2	Water Pumping Station 3 Electrical and Controls Upgrade	Design in progress	Construct 2010	\$900,000	\$423,000	\$1,323,000
	Sub Total			\$1,200,000	\$564,000	\$1,764,000
Project 3	Major Transmission System Improvement Projects					
Project 4	28,000 LFT of 24" & 30" watermain, WTP to Dupont; South to University	Design Complete	Construct 2011	\$10,000,000	\$4,700,000	\$14,700,000
Project 5	Water Meter Replacement Program 3,000 meters/year		2010-2015	\$1,000,000		\$5,000,000
Project 6	15,500 LFT of 12" & 24" watermain; Saginaw St, Flint River to Pierson Rd	2010	2012	\$3,800,000	\$1,786,000	\$5,586,000
Project 7	16,100 LFT of 16" watermain; Atherton Rd, Van Slyke to Dort	2010	2013	\$4,000,000	\$1,880,000	\$5,880,000
	Sub Total			\$18,800,000	\$8,366,000	\$31,166,000
	Minor Transmission System Improvement Projects					
Project 8	500 LFT of 6" watermain; Hamilton Ave, Mason St to MLK Blvd.	2010	2011	\$50,000	\$23,500	\$73,500
Project 9	1,650, LFT of 6" watermain; Sonny Ave, Dupont to Lawndale	2010	2011	\$165,000	\$77,550	\$242,550
Project 10	1500 LFT of 6" watermain; Walton St, Clairmont to Augusta	2010	2012	\$150,000	\$70,500	\$220,500
Project 11	1500 LFT of 6" watermain; East Blvd, Farmers Market to Park	2011	2013	\$150,000	\$70,500	\$220,500
Project 12	325 LFT of 6" watermain; Alexander St, Taylor to Rankin	2011	2014	\$32,500	\$15,275	\$47,775
Project 13	1075 LFT of 6" watermain; Mack St, Clio Rd to Winona	2011	2015	\$122,500	\$57,575	\$180,075
	Sub Total			\$670,000	\$314,900	\$984,900
	Total CIP Costs			\$20,670,000	\$9,244,900	\$33,914,900

APPENDIX C

Water Rate Schedule

effective 7/1/12

to \$
\$40 - 45/MO
For AVG.
Homeowner

SCHEDULE OF WATER RATES & CHARGES
EFFECTIVE FOR BILLS DUE AFTER 7/1, 2012

WATER CONSUMPTION RATESMetered Water

Rates per 100 cubic feet (ccf)	Rates Effective September 16, 2011		Rates For Bills Due After <u>7/1</u> , 2012	
	Inside City Rate	Outside City Rate	Inside City Rate	Outside City Rate
Through 35 ccf	6.683	10.008	7.518	11.259
Next 1,965 ccf	6.498	9.569	7.310	10.765
Over 2,000 ccf	5.148	7.713	5.792	8.677

WATER MONTHLY SERVICE CHARGESRemote Meter Monthly Charge

Meter Size	Rates Effective September 16, 2011		Rates For Bills Due After _____, 2012	
	Inside City Charge	Outside City Charge	Inside City Charge	Outside City Charge
5/8"	19.356	28.874	21.776	32.483
3/4"	37.210	55.739	41.861	62.706
1"	49.140	73.593	55.283	82.792
1-1/2"	49.140	73.593	55.283	82.792
2"	49.140	73.593	55.283	82.792

Non-Remote Meter Monthly Charge

Meter Size	Rates Effective September 16, 2011		Rates For Bills Due After _____, 2012	
	Inside City Charge	Outside City Charge	Inside City Charge	Outside City Charge
5/8"	23.406	35.269	26.332	39.678
3/4"	41.479	62.201	46.664	69.976
1"	53.291	80.055	59.952	90.062
1-1/2"	53.291	80.055	59.952	90.062
2"	53.291	80.055	59.952	90.062

Commercial & Industrial Monthly Charge

Meter Size	Rates Effective September 16, 2011		Rates For Bills Due After _____, 2012	
	Inside City Charge	Outside City Charge	Inside City Charge	Outside City Charge
5/8"	47.453	71.230	53.385	80.134
3/4"	54.456	81.524	61.263	91.715
1"	66.758	100.154	75.103	112.673
1-1/2"	95.783	143.809	107.756	161.785
2"	133.886	200.965	150.622	226.086
3"	264.396	398.639	297.448	446.469
4"	465.329	698.103	523.495	785.366
6"	915.048	1,372.326	1,029.429	1,543.867
8"	1,327.000	1,990.643	1,492.875	2,239.473
10"	1,831.781	2,762.201	2,060.754	3,107.476
12"	2,216.110	3,324.004	2,493.124	3,739.505
16"	2,757.899	4,136.771	3,102.636	4,653.867
20"	2,978.829	4,856.726	3,351.183	5,463.817

APPENDIX D

Consumer Confidence Report

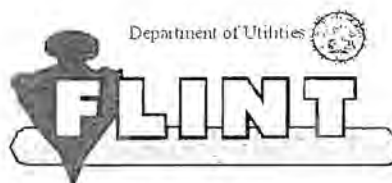
CUSTOMER SERVICE CENTER
CITY HALL
1101 S. SAGINAW ST.
FLINT, MI 48501

PRSRT STD
U.S. POSTAGE
PAID
FLINT, MI
Permit No. 6

DEQ
RESOURCE MANAGEMENT DIVISION

SEP 10 2012

LANSING DISTRICT



City of Flint
Water Plant & Facilities

2011 Consumers Annual Report on Water Quality

The City of Flint Department of Utilities is dedicated to providing a high quality drinking water to the residents of the community. The Consumers Annual Report on Water Quality provides important information about your drinking water. This report includes information about the source of the water, health information, a chart summarizing United States Environmental Protection Agency (USEPA) required testing results, and a table giving explanations of important terms to understand when viewing the test results. The Flint Water Plant & Facilities maintains total compliance with all state and federal regulations and is committed to prompt and thorough notification to the consumers if there is any reason for concern about the quality of the drinking water.

Information about your drinking water is available at the City of Flint web page on the Internet at www.cityofflint.com or by calling the Flint Water Plant & Facilities at (810) 787-6537. The Safe Drinking Water Hotline at (800) 426-4791 is a resource for health related questions and water quality issues. General drinking water information can be found on the USEPA web site at www.epa.gov/safewater/.

Water Source

The City of Flint purchases drinking water from the Detroit Water & Sewerage Department (DWSD) which operates several drinking water facilities. Following treatment to remove impurities, the water is pumped by DWSD to the Flint Water Plant, where the water is then monitored and distributed throughout the City.

The source water comes from the lower Lake Huron watershed. The watershed includes numerous short, seasonal streams that drain to Lake Huron. The Michigan Department of Environmental Quality in partnership with the U.S. Geological Survey, the Detroit Water & Sewerage Department, and the Michigan Public Health Institute performed a source water assessment in 2004 to determine the susceptibility of potential contamination. The susceptibility rating is a seven-tiered scale ranging from "very low" to "very high" based primarily on geologic sensitivity, water chemistry, and contaminant sources. The Lake Huron source water intake is categorized as having a moderately low susceptibility to potential contaminant sources. The Lake Huron water treatment plant has historically provided satisfactory treatment of this source water to meet drinking water standards. If you would like to know more information or a complete copy of the report, contact the City of Flint Water Plant at (810) 787-6537.

General Information

To ensure that tap water is safe to drink, the EPA prescribes regulations, which limit the amount of certain contaminants in water provided by the public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- ◆ **Microbial contaminants;** such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- ◆ **Inorganic contaminants;** such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- ◆ **Pesticides and herbicides;** which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- ◆ **Organic chemical contaminants;** including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- ◆ **Radioactive contaminants;** which can be naturally occurring or be the result of oil and gas production and mining activities.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

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 Department of Utilities 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 your potential exposure to lead in your water by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. 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 or at <http://www.epa.gov/safewater/lead>.

Lake Huron Water Treatment Plant

2011 Regulated Detected Contaminants Tables

Contaminant	Test Date	Units	Health Goal MCLG	Allowed Level MCL	Highest Level Detected	Range of Detection	Violation yes/no	Major Sources in Drinking Water
Inorganic Chemicals – Annual Monitoring at Plant Finished Water Tap								
Fluoride	08/14/2011	ppm	4	4	0.98	n/a	No	Erosion of natural deposits; Water additive, which promotes strong teeth; Discharge from fertilizer and aluminum factories.
Nitrate	08/14/2011	ppm	10	10	0.30	n/a	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Barium	6/9/2008	ppm	2	2	0.01	n/a	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
Disinfectant Residuals and Disinfection By-Products – Monitoring in Distribution System								
Total Trihalomethanes (TTHM)	Feb-Nov 2011	ppb	n/a	80	36.0	11.0 - 36.0	No	By-product of drinking water chlorination
Haloacetic Acids (HAA5)	Feb- Nov 2011	ppb	n/a	60	14.0	6.0 - 14.0	No	By-product of drinking water disinfection
Disinfectant (Total Chlorine Residual)	Jan-Dec 2011	ppm	MRDGL 4	MRDL 4	1.10	0.30 – 1.10	No	Water additive used to control microbes

2011 Turbidity – Monitored every 4 hours at Plant Finished Water Tap

Highest Single Measurement Cannot exceed 1 NTU	Lowest Monthly % of Samples Meeting Turbidity Limit of 0.3 NTU (minimum 95%)	Violation yes/no	Major Sources in Drinking Water
0.2 NTU	100%	No	Soil Runoff
Turbidity is a measure of the cloudiness of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.			

2011 Microbiological Contaminants – Monthly Monitoring in Distribution System

Contaminant	MCLG	MCL	Highest Number Detected	Violation yes/no	Major Sources in Drinking Water
Total Coliform Bacteria	0	Presence of Coliform bacteria > 5% of monthly samples	0	No	Naturally present in the environment.
<i>E. coli</i> or fecal coliform bacteria	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal or <i>E. coli</i> positive.	0	No	Human waste and animal fecal waste.

2011 Lead and Copper Monitoring at Customers' Tap

Contaminant	Test Date	Units	Health Goal MCLG	Action Level AL	90 th Percentile Value*	Number of Samples Over AL	Violation yes/no	Major Sources in Drinking Water
Lead	2011	ppb	0	15	< 2.0	0	No	Corrosion of household plumbing system; Erosion of natural deposits.
Copper	2011	ppm	1.3	1.3	0.102	0	No	Corrosion of household plumbing system; Erosion of natural deposits; Leaching from wood preservatives.

*The 90th percentile value means 90 percent of the homes tested have lead and copper levels below the given 90th percentile value. If the 90th percentile value is above the AL additional requirements must be met.

Regulated Contaminant	Treatment Technique	Running annual average	Monthly Ratio Range	Violation Yes/No	Typical Source of Contaminant
Total Organic Carbon (ppm)	The Total Organic Carbon (TOC) removal ratio is calculated as the ratio between the actual TOC removal and the TOC removal requirements. The TOC was measured each month and because the level was low, there is no requirement for TOC removal.				Erosion of natural deposits

2011 Special Monitoring

Contaminant	MCLG	MCL	Level Detected	Source of Contamination
Sodium (ppm)	n/a	n/a	4.76	Erosion of natural deposits

Collection, sampling result information and table provided by Detroit Water and Sewerage Department (DWSD) Water Quality Division, ML Semegen.
Distribution system sampling & result information (including lead & copper) provided by the City of Flint Water Plant, M Glasgow.

Key to Detected Contaminants Table

Symbol	Abbreviation for	Definition/Explanation
MCLG	Maximum Contaminant Level Goal	The level of contaminant in drinking water below which there is no known or expected risk to health.
MCL	Maximum Contaminant Level	The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MRDLG	Maximum Residual Disinfectant level goal	The level of a drinking water disinfectant below which there is no known or expected risk to health. MRLDG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.
MRDL	Maximum Residual Disinfectant Level	The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
ppb	Parts per billion (one in one billion)	The ppb is equivalent to micrograms per liter. A microgram = 1/1000 milligram.
ppm	Parts per million (one in one million)	The ppm is equivalent to milligrams per liter. A milligram = 1/1000 gram.
NTU	Nephelometric Turbidity Units	Measures the cloudiness of water.
ND	Not Detected	
TT	Treatment Technique	A required process intended to reduce the level of a contaminant in drinking water.
AL	Action Level	The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements which a water system must follow.
HAA5	Haloacetic acids	HAA5 is the total of bromoacetic, chloroacetic, dibromoacetic, dichloroacetic, and trichloroacetic acids. Compliance is based on the total of all five.
TTHM	Total Trihalomethanes	Total Trihalomethanes is the sum of chloroform, bromodichloromethane, dibromochloromethane and bromoform. Compliance is based on the total of all five.
pCi/l	picocuries per liter	A measure of radioactivity.
n/a	not applicable	
>	Greater than	



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

November 24, 2015

Mr. Michael Glasgow
Utilities Administrator
City of Flint
4500 North Dort Highway
Flint, Michigan 48505

WSSN: 2310

Dear Mr. Glasgow:

SUBJECT: Water Supply - City of Flint (City) Water Treatment Plant (WTP)
Standby Operation Requirements

The purpose of this letter is to summarize stand-by operation requirements for use of the City's WTP as an emergency back-up to allow for continuous supply of finished water to the City's entire distribution system in case of an interruption in water supply as a wholesale customer of the Detroit Water and Sewerage Department (DWSD) / Great Lakes Water Authority (GLWA).

At this time, the City WTP has been re-designated as an emergency standby WTP using the Flint River as its water source. Once connection to and raw water service from the Karegnondi Water Authority (KWA) becomes available, the City WTP may once again be converted back into continuous operation using KWA water from Lake Huron as its primary source, and the Flint River as an emergency standby source.

The City WTP, as an emergency standby facility, shall periodically test WTP operations to maintain operational reliability in accordance with the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), but shall not distribute treated water to its customers as part of these test operations. Instead, treated water shall be discharged to the Flint River in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) under the Natural Resources Environmental Protection Act, 1994 PA 451, as amended. The City WTP shall conduct these operational test runs on a quarterly basis for a minimum duration of one week (7 days) of continuous operation using conventional filtration and disinfection byproduct precursor removal. If the City intends to utilize additional treatment for precipitative softening as part of emergency standby operation, then quarterly operational test runs shall be conducted for a minimum duration of two weeks (14 days) continuous operation.

Water production operating ranges at the City WTP may be flexible, but must evaluate both operation and performance at varying flow rates under a scheme that incorporates all equipment required to achieve conventional filtration, including but not limited to coagulation, flocculation, sedimentation, and filtration, along with disinfection byproduct precursor removal using ozonation. Additional treatment for precipitative lime softening shall also be included, if applicable.

Adequate levels of treatment staffing shall be provided at the City WTP when in operation. The City shall continue to retain a full time F-1 level certified operator-in-charge (OIC) who shall supervise operation of the City WTP. The City shall also require an F-4 or higher level certified shift operator to be on site and in charge of each operating shift at the City WTP when the OIC is not on site. Sufficient staffing is essential in order to maintain 24-hour operation (either for test-run or emergency operation) of the WTP.

Operational monitoring shall be conducted during test-runs of the City WTP. An operations report shall be prepared for each completed WTP test-run. The operations report shall include all of the following information:

- Treatment rates (daily)
- Ozone dosage (daily)
- Ozone residual (daily average, maximum and minimum)
- Coagulant dosage as Fe^{+3} (daily)
- Turbidity
 - Raw (continuous)
 - Settled (every 4 hours)
 - Applied (every 4 hours)
 - Individual Filter Effluent (continuous)
 - Combined Filter Effluent (continuous)
- Chlorine dosage (daily)
- Chlorine residual (continuous, daily average, maximum and minimum)
- pH, raw and treated (every 8 hours)
- Total Hardness as CaCO_3 , raw and treated (every 8 hours)
- Non-Carbonate Hardness as CaCO_3 , raw and treated (every 8 hours)
- Calcium as Ca^{+2} , raw and treated (every 8 hours)
- Magnesium as Mg^{+2} raw and treated (every 8 hours)
- Chloride as Cl^- , raw and treated (every 8 hours)
- Total Coliform, raw, post ozone, settled, applied and treated (every 8 hours)
- Heterotrophic Plate Count, raw and treated (every 8 hours)
- Temperature degrees Celsius, raw and treated (every 8 hours)
- Department of Environmental Quality (DEQ) Unit 37 Chemical Analysis, treated water (once per test run by certified lab)

If the City WTP is placed into operation as a result of an emergency, the City shall continue operation of its corrosion control treatment system in accordance with the

Mr. Michael Glasgow

3

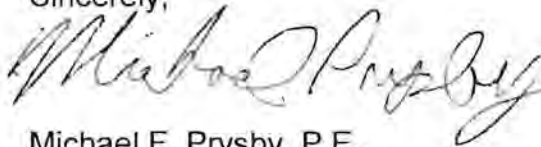
November 24, 2015

provisions outlined in the DEQ's October 30, 2015, letter to the City, *Corrosion Control Treatment Operation*, attached.

Treated water that is discharged must meet the bacteriological and turbidity requirements of Act 399 as a condition of operational preparedness. Treated water that is discharged must also meet any requirements set forth by the DEQ, Water Resource Division (WRD). Please note that according to a November 6, 2015, letter from the DEQ, WRD, to the City, the City's Certificate of Coverage (COC) MIG640053, issued under the NPDES General Permit No. MIG640000, expired April 1, 2015. A COC under this General Permit must be obtained prior to any discharge from the City WTP. Please contact Ms. Stephanie Kammer, acting Lansing District supervisor, WRD, at 517-897-1597 or kammers@michigan.gov, regarding NPDES permitting issues.

Our office would be glad to meet with City staff to further discuss test-run operations in more detail and answer any questions. If you have any questions regarding this correspondence, please contact me at the number below or at prysbym@michigan.gov.

Sincerely,



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

Enclosure

cc: Ms. Natasha Henderson, City of Flint
Mr. Brent Wright, City of Flint
Mr. Stephen Busch, DEQ
Ms. Stephanie Kammer, DEQ



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

W33N 2310
Comp. File

November 6, 2015

CERTIFIED MAIL

7011 2970 0004 5029 4508

Mr. Michael Glasgow
Utilities Administrator
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502

VN-006225

Dear Mr. Glasgow:

SUBJECT: Violation Notice

The Department of Environmental Quality (DEQ), Water Resources Division (WRD), has determined that the City of Flint Water Treatment Plant (WTP) is in violation of Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended, MCL 324.3101 *et seq.* and the Administrative Rules promulgated there under being 2006 AACRS R 323.2101 *et seq.*, as amended and Certificate of Coverage (COC) No. MIG640053 issued under the National Pollutant Discharge Elimination System (NPDES) General Permit No. MIG640000, which was issued on April 1, 2010, and expired April 1, 2015.

On October 22, 2015, WRD staff received a citizen complaint alleging the discharge and accumulation of a black substance into the Flint River in the vicinity of a Flint WTP outfall, which is located on the west bank of the Flint River, north of North Dort Highway and east of Stewart Avenue. This outfall is also known as Outfall 002 and is referenced in the COC.

On October 23, 2015, WRD staff inspected the site and verified the existence of what appeared to be Anthracite or Granulated Activated Carbon (GAC) that had been discharged from Outfall 002 and accumulated downstream of the outfall.

On October 26, 2015, WRD staff (Ms. Stephanie Kammer and Mr. Charles Bennett) spoke via phone with you and Mr. Brent Wright, about the discharge of material to the river. At that time, you speculated that it may be Anthracite or GAC from the water filtration process of the WTP. During that conversation, we directed you to collect a sample of the material from the riverbed and analyze it for content.

Mr. Michael Glasgow

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November 6, 2015

2. A detailed explanation of the source, and circumstances that resulted in the discharges of GAC to the Flint River, including an estimate of how much GAC was discharged and how future discharges of material will be prevented;
3. Verification that discharges of residual chlorine have ceased;
4. A detailed explanation of the source(s) of residual chlorine, including all possible locations of discharges, the circumstances leading up to and resulting in discharges, the rates, volumes, timeframes, and all other relevant details, including how future discharges will be prevented; and
5. A detailed explanation of the source of turbid water discharged from Outfall 002 seen in the YouTube video of March 26, 2015. Explanation should include the circumstances and all possible sources of turbid water discharges. A log of filter backwashing activity, including the times, rates, volumes, characteristics of the discharge, and all other relevant details, including an estimation of how frequently similar discharges occurred and how future discharges will be prevented.

If you have any factual information you would like us to consider regarding the violations identified in this Notice, please provide them with your written response.

We anticipate and appreciate your cooperation in resolving this matter. Should you require further information regarding this Notice or if you would like to arrange a meeting to discuss it, please contact me or Mr. Charles Bennett, PE, Water Resources Division, Lansing District Office, at 517-284-6659; bennettc4@michigan.gov; or Department of Environmental Quality, 525 West Allegan Street, P.O. Box 30242, Lansing, Michigan 48909.

Sincerely,



Stephanie Kammer
Acting District Supervisor
Lansing District Office
Water Resources Division
517-897-1597

sk:cb:sb

cc: Ms. Natasha Henderson, Flint, City Administrator
Mr. Howard Croft, Flint, DPW Director
Mr. Brent Wright, Flint, WTP Supervisor
Mr. Stephen Busch, DEQ-ODWMA
Mr. Jon Russell, DEQ-WRD-FOS
Mr. Charles Bennett, DEQ-WRD-LDO

During that conversation, we discussed that clear water was flowing steadily from Outfall 002 during the inspection. Your staff sampled that discharge on the morning of October 26, 2015, and found a total residual chlorine (TRC) level of 4 mg/l, which is more than 20 times the limit of 200 ug/l authorized by the COC during an intermittent discharge of 160 minutes per day. The facility's COC has expired; therefore, no discharge of treated effluent is authorized from this outfall.

In addition, we understand the 72" line used to transport water to Flint from the Detroit Water and Sewerage Department (DWSD) system would have been disinfected with chlorine prior to reconnection of the supply to Flint may have been discharged to the storm sewer system. What was (were) the location(s), volume, duration, and residual chlorine level of that water during discharge?

On October 28, 2015, Mr. Wright confirmed in a telephone message to DEQ (Mr. Charles Bennett) that the material was GAC and sand from the plant filtration system that had been discharged with backwash water, to the outfall due to a mechanical problem with pumps and that staff traced the material up the discharge line and back into the WTP. DEQ WRD staff directed you to properly remove the accumulated material from the Flint River as soon as possible and to keep us involved in your planning and removal process.

On October 28, 2015, we shared with you a video clip that was sent to us from another complainant on October 27, 2015. The video, which has been posted to YouTube shows an unlawful discharge of brownish material from Outfall 002 to the Flint River. The voice on the video states the discharge is occurring on March 26, 2015 and was posted to YouTube on that date. The complainant states he has seen similar discharges from that outfall numerous times. As a result of this discharge, the receiving water contained unnatural turbidity, color, oily films, settleable solids, suspended solids, or deposits, which is a violation of Part 31.

It is our understanding that due to the switch back to DWSD, the treatment plant has not backwashed since October 16, 2015; and therefore, the violations of discharges of GAC and unnatural turbidity identified in this Violation Notice have ceased. It is unknown if the violations of TRC are continuing.

The City of Flint WTP should take immediate action to assure all unpermitted discharges from Outfall 002 have ceased.

Please submit a response to this office by November 30, 2015. At a minimum, the response shall include:

1. A plan for removal of the GAC from the Flint River. If the material has already been removed, please provide a description of the remedial actions taken including amount of material removed;



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

October 30, 2015

VIA E-MAIL and U.S. MAIL

Mr. Mike Glasgow
Utilities Administrator
City of Flint
4500 North Dort Highway
Flint, Michigan 48505

Dear Mr. Glasgow:

SUBJECT: Water Supply – City of Flint (City) – Corrosion Control Treatment Operation

The purpose of this letter is to outline additional requirements and recommendations regarding the additional corrosion control treatment measures being taken by the City water system.

The City has been purchasing drinking water from the Detroit Water and Sewerage Department (DWSD)/Great Lakes Water Authority (GLWA) since Friday, October 16, 2015. DWSD/GLWA provides corrosion control treatment to its water and DWSD/GLWA has been deemed by the Michigan Department of Environmental Quality (MDEQ) to have fully optimized corrosion control treatment. This optimization requires DWSD/GLWA to provide orthophosphate addition, maintain a minimum dose of 0.9 milligrams per liter (mg/L) as PO_4 , and maintain a DWSD/GLWA plant tap residual of 0.8 mg/L as PO_4 . As part of its optimization, DWSD/GLWA is also required to maintain a minimum pH of 7.0 at the DWSD/GLWA plant tap.

Corrosion Control Treatment and Operation

To further enhance pipe passivation in the City water distribution system, customer service lines, and customer plumbing, **the City shall dose additional orthophosphate to increase distribution system phosphate residual to a minimum of 3.1 mg/L as PO_4 (1.0 mg/L as P).** The City has obtained a Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), water system construction permit for the installation of this treatment equipment at Control Station 2 and Pump Station 4, construction permit number W151104, issued on October 28, 2015.

The City should also maintain a minimum pH level of 7.0 throughout the City's water distribution system. If pH levels of 7.0 or less are detected, the City shall immediately notify the MDEQ.

As part of the City water system operations, the City shall conduct:

- **Daily monitoring of incoming DWSD/GLWA water for pH and for orthophosphate residual, as PO_4**
- **Daily monitoring of additional orthophosphate dosage, as PO_4**
- **Daily monitoring of water entering the City distribution system for pH and for orthophosphate residual, as PO_4**

This information shall be included in the City's monthly operation report and shall be reported to the MDEQ as required under Administrative Rule 1502 (R 325.11502) of the administrative rules promulgated pursuant to Act 399.

Enhanced Water Quality Parameter Monitoring

The City's revised monitoring schedule dated October 22, 2015, requires quarterly Water Quality Parameter Monitoring at 25 sites throughout the City's water distribution system for temperature (Celcius), Conductivity (mS), pH, Total Alkalinity (mg/L as CaCO_3), Calcium (mg/L as Ca^{2+}), and orthophosphate (mg/L PO_4). Ten of these 25 sites are also used by the City to conduct required total coliform bacteria and chlorine residual monitoring (location numbers 1, 2, 3, 4, 5, 6, 7, 8, CS, and WS). **At these ten locations, the City shall also conduct weekly monitoring for the following parameters at the same time that total coliform bacteria and chlorine residual monitoring is conducted to further assess water stability:**

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

In addition to the 10 locations, the entry point to the distribution system should be one of the locations for enhanced water quality parameter monitoring.

If orthophosphate residual levels less than 3.1 mg/L as PO_4 (1.0 mg/L as P) are detected at any of these locations, then orthophosphate dosage shall be increased to achieve the minimum phosphate residual of 3.1 mg/L as PO_4 (1.0 mg/L as P) at all locations. In addition, if pH levels of 7.0 or less are detected at any of these locations, the City shall immediately notify the MDEQ.

Corrosion Control Treatment Test Loops

To further confirm the effectiveness of corrosion control treatment and the City's operations, it is recommended that the City construct, install, and monitor test loops of service line and plumbing materials. Instructions for construction, installation, and monitoring of these test loops can be obtained from the United States Environmental Protection Agency's (U.S. EPA) Office of Research and Development. The U.S. EPA has also offered to provide analytical services to support this investigative effort. Please contact Mr. Darren Lytle, Acting Branch Chief, at 512-569-7432 or lytle.darren@epa.gov.

Lead Service Line Verification Sampling

The City has been reviewing customer service connection records in order to confirm customer service line materials at each connection. The U.S. EPA has developed a sampling procedure that can be used to help verify the presence of lead service lines and it is recommended that the City conduct this sampling at a selection of customer locations for this purpose. Information regarding this verification sampling can also be obtained from Mr. Lytle. Any water analysis for samples meeting the criteria for inclusion in the 90th percentile calculation for lead and copper compliance must be completed by a certified laboratory.

Mr. Mike Glasgow

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October 30, 2015

Customer Household Exposure Assessment

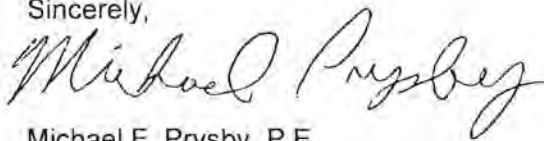
The Michigan Department of Health and Human Services (MDHHS) is continuing to conduct blood lead level testing for children in the City. Families with children found to have elevated blood lead levels will be asked to have an elevated blood lead level investigation conducted at their residence that will include a lead exposure assessment, including the contribution of lead from water service lines and premise plumbing. This diagnostic testing is different than the first draw sampling being conducted by the City and should help further substantiate the effectiveness of corrosion control treatment. Any water analysis samples meeting the criteria for inclusion in the 90th percentile calculation for compliance purposes for lead and copper must be completed by a certified laboratory.

Flint Water Treatment Plant Evaluation of Karegnondi Water Authority (KWA) Raw Water

The City is planning to change source water in the next year to raw water from Lake Huron purchased from the KWA. The City is required to evaluate the Flint Water Treatment Plant (WTP) processes related to optimization of corrosion control treatment using source water purchased from the KWA to determine if any adjustments are necessary. It is recognized that full scale testing at the Flint WTP may not be feasible. A report of this evaluation shall be provided to our office for review and approval prior to initiating service of this treated water to its customers.

If you have any questions regarding this correspondence, please contact me at the number below or at prysbym@michigan.gov.

Sincerely,



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

cc: Mr. Brent Wright, City of Flint
Mr. Howard Croft, City of Flint
Ms. Natasha Henderson, City of Flint
Mr. Darren Lytle, U.S. EPA
Mr. Samir F. Matta, P.E., Lockwood, Andrews & Newnam, Inc.
Mr. Warren Green, Lockwood, Andrews & Newnam, Inc.
Mr. James Henry, Genesee County Health Department
Dr. Linda Dykema, MDHHS
Mr. Jim Sygo, Chief Deputy Director, MDEQ
Mr. Stephen Busch, MDEQ
Mr. Adam Rosenthal, MDEQ



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

October 22, 2015

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

WSSN: 02310

Dear Mr. Wright:

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

Monitoring Schedule:

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

Monthly Operation Report (MOR) Requirements:

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

Mr. Brent Wright

2

October 22, 2015

Disinfection By-Product Sample Siting Plans:

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

Lead and Copper Monitoring Requirements and Site Sample Pool

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

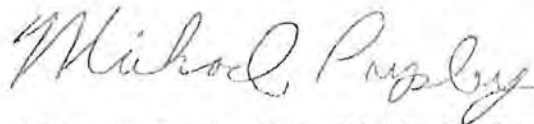
The City shall also conduct additional operational monitoring to demonstrate the effectiveness of corrosion control treatment.

Record Keeping:

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

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

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



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



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

Enclosure

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

2015 Monitoring Schedule

FLINT, CITY OF
WSSN: 02310

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

Location: Distribution System

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

Community Water Supply 2015 Monitoring and Reporting Requirements

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

August 24, 2015

Mr. Brent Wright, Operation Supervisor
City of Flint - D P W
Flint Water Plant
4500 North Dort Highway
Flint, Michigan 48505

WSSN: 02310
Genesee County

Dear Mr. Wright:

SUBJECT: Drinking Water System Monitoring – Reminder

This is just a friendly reminder that drinking water monitoring is due by September 30. This is not a notice of violation. This gives you a chance to verify that your submitted sample results match what we have received.

According to our records, not all drinking water monitoring has been performed as outlined in the Monitoring Schedule sent to you earlier this year. Please refer to the enclosed monitoring schedule to see which laboratory results we have not yet received. If you have results for monitoring listed in the schedule, please send us a copy.

If monitoring has not yet been completed, please collect the required sample(s) no later than **September 30**, unless otherwise noted, to avoid monitoring violations, public notice requirements, and possibly administrative fines of at least \$200. If you use a private laboratory, please send us copies of the results by October 10.

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

If you have any questions or believe that the enclosed monitoring schedule is not accurate, please contact me at the number below; rosenthala@michigan.gov; or DEQ, 525 West Allegan, 1st floor Southwest – Constitution Hall, PO Box 30242, Lansing, MI 48909.

Sincerely,

Adam Rosenthal
Environmental Quality Analyst
Field Operations Section
517-284-6644

Enclosure

cc: Mr. Mike Glasgow, City of Flint

2015 Monitoring Schedule

FLINT, CITY OF

WSSN: 02310

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

Location: Plant Tap

Collect these samples at the entry point to the distribution system (after treatment, if applicable.)

Sample Type	# Samples/ Frequency	Collect Before	Site Code	Fee	Unit Number	Test Code
Automated Partial Chemistry	This DEQ lab scan includes nitrate, nitrite, fluoride, and sodium whose monitoring frequency requirements differ from one another. Before requesting analyses from a laboratory other than the DEQ laboratory, check with your DEQ district staff for the specific monitoring requirements.					
	1/3 months	Quarterly	TP001	\$18.00	32	R
Volatile Organic Compounds	1/3 months	Quarterly	TP001	\$100.00	36VO	CXVO
Complete Metals	1/36 months	09/30/2017	TP001	\$102.00	36ME	CMET2
Arsenic	1/3 months	Quarterly	TP001	\$18.00	36ME	CAS
Cyanide	1/3 months	Quarterly	TP001	\$25.00	36CNa	CCN
SOC – Pesticides	1/3 months	Quarterly	TP001	\$125.00	36PT	CXPT
SOC – Herbicides	1/3 months	Quarterly	TP001	\$120.00	36HB	CXHB
SOC – Carbamates	1/3 months	Quarterly	TP001	\$120.00	36LP	CXLP
Bromate	1/1 months	Monthly	TP001	Not performed at the DEQ Laboratory. A list of certified labs is at www.michigan.gov/DEQ . Select Water, Drinking Water, Community Water Supply, then Certified Labs under Programs and Activities.		
Gross Alpha (Radiological)	1/3 months	Quarterly	TP001			
Radium 226 & Radium 228	1/3 months	Quarterly	TP001			
Water Quality Parameters	25/3 months	Quarterly	TP001	Various	Various	Various
Total Organic Carbon (TOC)	Pair/Monthly	Monthly	TP001	\$35.00	36TO	CTOC
	Monitor for TOC in the source water before any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to as "paired samples." Collect the treated water sample not later than the point of combined filter effluent turbidity monitoring and representative of treated water.					
Expanded SOC's						
Dalapon & Haloacetic Acids	1/12 months	Between 04/01 and 09/30/2015	TP001	\$130.00	36HA	CXHA
Diquate	1/12 months	Between 04/01 and 09/30/2015	TP001	\$150.00	36DQ	CXDQ
Endothall	1/12 months	Between 04/01 and 09/30/2015	TP001	\$150.00	36EN	CXEN
EDB & DBCP	1/12 months	Between 04/01 and 09/30/2015	TP001	\$70.00	36VO	CXEV

2015 Monitoring Schedule

FLINT, CITY OF
WSSN: 02310

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Location: Distribution System

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

February 13, 2015

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

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Drinking Water Monitoring Schedule – 2015
Annual Reports

Enclosed is your Drinking Water Monitoring Schedule for calendar year 2015 outlining the minimum requirements for your public water supply. Collect samples early in the monitoring period of the year indicated on the schedule. If you use a private laboratory you are required to report the results to us within the first ten days of the month following the month that you received the results. To receive credit for monitoring, the "**WSSN**" (water supply serial number), the "**Site Code**," and "**County**" must appear on the sample result. Bottles will NOT be mailed automatically. If you use the DEQ Laboratory, you can order bottles by calling 517-335-8184. Be certain of the EPA sampling and analysis method requirements for hold times.

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

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

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

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

MFP:AR:JR

Enclosure
cc/encl: Mr. Mike Glasgow, City Of Flint

2015 Monitoring Schedule

FLINT, CITY OF

WSSN: 02310

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2015 Monitoring Schedule

FLINT, CITY OF

WSSN: 02310

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Community Water Supply 2015 Monitoring and Reporting Requirements

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

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RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

TO: Water Supply Superintendent or Operator In Charge
DATE: August 21, 2014
SUBJECT: 2014 Drinking Water System Monitoring – Reminder

This is just a friendly reminder that drinking water monitoring is due by September 30, 2014. This is not a notice of violation. This allows you the opportunity to verify that your submitted sample results match what we have received.

According to our records, not all drinking water monitoring has been performed as outlined in the 2014 Monitoring Schedule sent to you earlier this year. Please refer to the enclosed monitoring schedule to see which laboratory results we have not yet received. If you have results for monitoring listed in the schedule, please provide a copy to this office.

If monitoring has not yet been completed, please collect the required sample(s) no later than **September 30, 2014**, unless otherwise noted, to avoid monitoring violations, public notice requirements, and possibly administrative fines of at least \$200. If you use a private laboratory to analyze your samples, you must provide this office with copies of the results by October 10, 2014.

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

Reminder if Lead and Copper Monitoring Due This Year: The Lead and Copper Rule requires you to provide individual lead tap results, within 30 days of learning of results, to people who receive water from sites that were sampled, even if lead was not detected. You must also send us certification that you met all the delivery requirements along with a sample copy of your customer notice within 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.

If you have any questions or believe that the enclosed monitoring schedule is not accurate, please contact me at the number below.

Sincerely,

Adam Rosenthal
Environmental Quality Analyst
Field Operations Section
Office of Drinking Water and
Municipal Assistance
517-284-6644
rosenthala@michigan.gov

Enclosure

2014 Monitoring Schedule

FLINT, CITY OF
WSSN: 02310

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

Location: Plant Tap

Collect these samples at the entry point to the distribution system (after treatment, if applicable.)

Sample Type	# Samples/ Frequency	Collect Before	Site Code	Fee	Unit Number	Test Code
Automated Partial Chemistry	This DEQ lab scan includes nitrate, nitrite, fluoride, and sodium whose monitoring frequency requirements differ from one another. Before requesting analyses from a laboratory other than the DEQ laboratory, check with your DEQ district staff for the specific monitoring requirements.					
	1/3 months	Quarterly	TP001	\$18.00	32	R
Volatile Organic Compounds	1/3 months	Quarterly	TP001	\$100.00	36VO	CXVO
Complete Metals	1/36 months	09/30/2014	TP001	\$102.00	36ME	CMET2
Arsenic	1/3 months	Quarterly	TP001	\$18.00	36ME	CAS
Cyanide	1/3 months	Quarterly	TP001	\$25.00	36CNa	CCN
SOC – Pesticides	1/3 months	Quarterly	TP001	\$125.00	36PT	CXPT
SOC – Herbicides	1/3 months	Quarterly	TP001	\$120.00	36HB	CXHB
SOC – Carbamates	1/3 months	Quarterly	TP001	\$120.00	36LP	CXLP
Gross Alpha (Radiological)	1/3 months	Quarterly	TP001	Not performed at the DEQ Laboratory. A list of certified labs is at www.michigan.gov/DEQ . Select Water, Drinking Water, Community Water Supply, then Certified Labs under Programs and Activities.		
Radium 226 & Radium 228	1/3 months	Quarterly	TP001			
Water Quality Parameters	Bi-weekly	Every 2 Weeks	TP001	Various	Various	Various
Total Organic Carbon (TOC)	Pair/Monthly	Monthly	TP001	\$35.00	36TO	CTOC
	Monitor for TOC in the source water before any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to as "paired samples." Collect the treated water sample not later than the point of combined filter effluent turbidity monitoring and representative of treated water.					
Expanded SOCs						
Dalapon & Haloacetic Acids	1/12 months	Between 04/01 and 09/30/2014	TP001	\$130.00	36HA	CXHA
Diquate	1/12 months	Between 04/01 and 09/30/2014	TP001	\$150.00	36DQ	CXDQ
Endothall	1/12 months	Between 04/01 and 09/30/2014	TP001	\$150.00	36EN	CXEN
EDB & DBCP	1/12 months	Between 04/01 and 09/30/2014	TP001	\$70.00	36VO	CXEV

2014 Monitoring Schedule

FLINT, CITY OF

WSSN: 02310

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

Location: Distribution System

Sample Type	Collect Samples According to the ...	# Samples/ Frequency	Collect	Site Code	Fee	Unit Number	Test Code
Bacteriological – coliforms	TCR Sampling Site Plan	100/Monthly	Monthly	DIST	\$16.00	30	BPTC
Chlorine Residual	DBP Monitoring Plan	Measure the residual disinfectant level at the same point and at the same time as the bacteriological sample and report the average to the DEQ.					
Lead Copper for Corrosion Control	Lead and Copper Sampling Pool	100/6 months	Between 07/01 and 12/31/2014	DIST	\$26.00	36CC	CCUB
Water Quality Parameters	Representative Sites	25/Quarterly	Quarterly	DIST	Various	Various	Various
Total Trihalomethanes	DBP Monitoring Plan	8/3 months	During February, May, August and November 2014	See DBP Monitoring Plan	\$65.00	36VO	CXTM
Haloacetic Acids		8/3 months	During February, May, August and November 2014	See DBP Monitoring Plan	\$130.00	36HA	CXHA



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

February 26, 2014

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

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Drinking Water Monitoring Schedule – 2014
Annual Reports

Enclosed is your Drinking Water Monitoring Schedule for calendar year 2014 outlining the minimum requirements for your public water supply. Collect samples early in the monitoring period of the year indicated on the schedule. If you use a private laboratory you are required to report the results to us within the first ten days of the month following the month that you received the results. To receive credit for monitoring, the "**WSSN**" (water supply serial number), the "**Site Code**," and "**County**" must appear on the sample result. Bottles will NOT be mailed automatically. If you use the DEQ Laboratory, you can order bottles by calling 517-335-8184. Be certain of the EPA sampling and analysis method requirements for hold times.

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

Also enclosed is the document "2014 Monitoring and Reporting Requirements." This provides additional details about monitoring and reporting requirements. If you have any questions, please contact us by telephone or email using the information below.

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

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

MFP:AR:JR
Enclosure

cc/encl: Mr. Robert Bisnick, City Of Flint

2014 Monitoring Schedule

FLINT, CITY OF

WSSN: 02310

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

Location: Distribution System

Sample Type	Collect Samples According to the ...	# Samples/ Frequency	Collect	Site Code	Fee	Unit Number	Test Code
Bacteriological – coliforms	TCR Sampling Site Plan	100/Monthly	Monthly	DIST	\$16.00	30	BPTC
Chlorine Residual	DBP Monitoring Plan	Measure the residual disinfectant level at the same point and at the same time as the bacteriological sample and report the average to the DEQ.					
Lead Copper for Corrosion Control	Lead and Copper Sampling Pool	23/36 months	Between 06/01 and 9/30/2014	DIST	\$26.00	36CC	CCUB
Water Quality Parameters	Representative Sites	10/Quarterly	Quarterly	DIST	Various	Various	Various
Total Trihalomethanes	DBP Monitoring Plan	4/3 months	During February, May, August and November 2014	See DBP Monitoring Plan	\$65.00	36VO	CXTM
Haloacetic Acids		4/3 months	During February, May, August and November 2014	See DBP Monitoring Plan	\$130.00	36HA	CXHA

MAJOR DISCUSSION
*
SUBJ to change
at WTP to
assume OP.
APR 2014 *

This schedule
Based on
continuing DWPD
schedule - Revised
schedule will be
sent if
source does
MFP to draft LTR



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

April 16, 2014

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

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Revised Drinking Water Monitoring Schedule – 2014
Monthly Operation Reports
Siting Plans and Record Keeping

Monitoring Schedule:

Enclosed is your revised Drinking Water Monitoring Schedule for calendar year 2014 outlining the minimum requirements for your public water supply. Your schedule has been revised based on the City's intent to change the source of its drinking water from the Detroit Water and Sewerage Department to treatment of the Flint River utilizing the City's Water Treatment Plant. Collect samples early in the monitoring period of the year indicated on the schedule. If you use a private laboratory you are required to report the results to us within the first ten days of the month following the month that you received the results. To receive credit for monitoring, the "**WSSN**" (water supply serial number), the "**Site Code**," and "**County**" must appear on the sample result. Bottles will NOT be mailed automatically. If you use the Department of Environmental Quality Laboratory, you can order bottles by calling 517-335-8184. Be certain of the United States Environmental Protection Agency sampling and analysis method requirements for hold times.

Please note that both distribution and entry point to the distribution system monitoring will increase upon plant startup.

Monthly Operation Report (MOR) Requirements:

The City shall submit MORs as required under Administrative Rule 1502 (R325.11502). In addition to plant operational data collected and as noted in the attached schedule, the City of Flint will be required to collect Total Organic Compounds (TOC) samples from the source and finish water on a monthly basis. You will also be required to collect Water Quality Parameters (WQPs) at your entry point every 2 weeks. The City must also demonstrate adequate contact time (CT) for disinfection in accordance with Administrative Rule 1505a (R325.11505a).

Mr. Brent Wright

2

April 16, 2014

Disinfection By-Product Sample Siting Plans:

The City of Flint must return to routine standard monitoring of disinfection by-products, and a revised Disinfection & Disinfectants By-Product (DDBP) plan must be submitted, which identifies 4 additional sites, 8 sites in total, for routine quarterly monitoring. These sites must be selected in accordance with the Stage 2 DDBP Rule and supporting documentation must be submitted with the plan for review and approval by this office prior to monitoring.

Lead and Copper Monitoring Requirements and Site Sample Pool

This change in source also increases your distribution system monitoring for WQPs to 25 samples per 6 months and 100 sample locations for Lead & Copper for 2 consecutive 6 month rounds of monitoring. The City will need to expand its current sample site pool in accordance with the requirements of Administrative Rule 710a (R325.10710a). A list of the proposed sample site pool locations, including each site's Tier, sample category, service material, and building plumbing material, shall be submitted to this office for review and approval.

Record Keeping:

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

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

Also enclosed is the document "2014 Monitoring and Reporting Requirements." This provides additional details about monitoring and reporting requirements. If you have any questions, please contact us by telephone or e-mail using the information below.



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



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

Enclosure

cc/encl: Mr. Robert Bisnick, City Of Flint
Genesee Co. Health Dept.

2014 Monitoring and Reporting Requirements

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

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

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

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

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

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

UCMR3 Monitoring: You may have monitoring requirements in 2014 under the third Unregulated Contaminant Monitoring Rule (UCMR3). The U.S. EPA will contact you directly if your water supply is required to monitor in 2014. A list of laboratories certified to analyze the samples collected for UCMR3 is available at <http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/upload/lablist.pdf>. Contact the U.S. EPA with questions.

Reminder if Lead and Copper Monitoring Due This Year: You must 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 the customer notice within 3 months after the end of the monitoring period. Water supplies that failed to distribute the Consumer Notice of Lead Results must include the following statement in their CCR, "During the year, we failed to provide lead results to persons served at the sites that were tested as required by the Lead and Copper Rule." To download the *Lead and Copper Report and Consumer Notice of Lead Result Certificate* in Microsoft Word or PDF format, visit www.michigan.gov/deq. Click on Water, Drinking Water, Community Water Supply, and Reporting Forms (under Manuals, Forms & Brochures).

Annual Reports: Act 399 requires certain reports to be submitted to this office each year.

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

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

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

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

- The **Consumer Confidence Report**, due by July 1 to your customers, to your local health department and to this office.

Electronic delivery methods may be used to distribute the CCR to bill-paying customers, provided they are direct. For more information on e-delivery, visit www.michigan.gov/deq. Click on Water, Drinking Water, Community Water Supply, Consumer Confidence Report Rule (under Laws and Rules).

2014 Monitoring Schedule

FLINT, CITY OF

WSSN: 02310

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

Location: Plant Tap

Collect these samples at the entry point to the distribution system (after treatment, if applicable.)

Sample Type	# Samples/ Frequency	Collect Before	Site Code	Fee	Unit Number	Test Code
Automated Partial Chemistry	This DEQ lab scan includes nitrate, nitrite, fluoride, and sodium whose monitoring frequency requirements differ from one another. Before requesting analyses from a laboratory other than the DEQ laboratory, check with your DEQ district staff for the specific monitoring requirements.					
	1/3 months	Quarterly	TP001	\$18.00	32	R
Volatile Organic Compounds	1/3 months	Quarterly	TP001	\$100.00	36VO	CXVO
Complete Metals	1/36 months	09/30/2014	TP001	\$102.00	36ME	CMET2
Arsenic	1/3 months	Quarterly	TP001	\$18.00	36ME	CAS
Cyanide	1/3 months	Quarterly	TP001	\$25.00	36CNa	CCN
SOC – Pesticides	1/3 months	Quarterly	TP001	\$125.00	36PT	CXPT
SOC – Herbicides	1/3 months	Quarterly	TP001	\$120.00	36HB	CXHB
SOC – Carbamates	1/3 months	Quarterly	TP001	\$120.00	36LP	CXLP
Gross Alpha (Radiological)	1/3 months	Quarterly	TP001	Not performed at the DEQ Laboratory. A list of certified labs is at www.michigan.gov/DEQ . Select Water, Drinking Water, Community Water Supply, then Certified Labs under Programs and Activities.		
Radium 226 & Radium 228	1/3 months	Quarterly	TP001			
Water Quality Parameters	Bi-weekly	Every 2 Weeks	TP001	Various	Various	Various
Total Organic Carbon (TOC)	Pair/Monthly	Monthly	TP001	\$35.00	36TO	CTOC
	Monitor for TOC in the source water before any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to as "paired samples." Collect the treated water sample not later than the point of combined filter effluent turbidity monitoring and representative of treated water.					
Expanded SOCs						
Dalapon & Haloacetic Acids	1/12 months	Between 04/01 and 09/30/2014	TP001	\$130.00	36HA	CXHA
Diquate	1/12 months	Between 04/01 and 09/30/2014	TP001	\$150.00	36DQ	CXDQ
Endothall	1/12 months	Between 04/01 and 09/30/2014	TP001	\$150.00	36EN	CXEN
EDB & DBCP	1/12 months	Between 04/01 and 09/30/2014	TP001	\$70.00	36VO	CXEV

2014 Monitoring Schedule

FLINT, CITY OF
WSSN: 02310

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

Location: **Distribution System**

Sample Type	Collect Samples According to the ...	# Samples/ Frequency	Collect	Site Code	Fee	Unit Number	Test Code
Bacteriological – coliforms	TCR Sampling Site Plan	100/Monthly	Monthly	DIST	\$16.00	30	BPTC
Chlorine Residual	DBP Monitoring Plan	Measure the residual disinfectant level at the same point and at the same time as the bacteriological sample and report the average to the DEQ.					
Lead Copper for Corrosion Control	Lead and Copper Sampling Pool	100/6 months	Between 07/01 and 12/31/2014	DIST	\$26.00	36CC	CCUB
Water Quality Parameters	Representative Sites	25/Quarterly	Quarterly	DIST	Various	Various	Various
Total Trihalomethanes	DBP Monitoring Plan	8/3 months	During February, May, August and November 2014	See DBP Monitoring Plan	\$65.00	36VO	CXTM
Haloacetic Acids		8/3 months	During February, May, August and November 2014	See DBP Monitoring Plan	\$130.00	36HA	CXHA



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

TO: Water Supply Superintendent or Operator In Charge
FROM: Office of Drinking Water and Municipal Assistance, Lansing District Office
DATE: May 15, 2013
SUBJECT: 2012 Consumer Confidence Report Reminder

Your annual Consumer Confidence Report (CCR) is due to be delivered by July 1st.

You may use any combination of mail, hand delivery, or electronic means to directly deliver the CCR to all your bill-paying customers (in addition to making a good faith effort to reach non-bill-paying customers). This means you can mail the CCR to customers, or mail a notification that the CCR is available, or email a notification of availability. The CCR can be accessible on the Internet via a direct URL, attached to the email, or embedded in the email. A direct URL means the web address links directly to the entire CCR. The notification should tell customers how to request a paper copy. If you normally publish a non-English language CCR, then the notification of CCR availability should also be in that language.

Refer to last year's report and your most recent sample results when preparing this year's report. For more information on preparing your CCR, visit <http://michigan.gov/deq>. Click on Water, Drinking Water, Community Water Supply, and Consumer Confidence Report Rule.

In addition to delivering your CCR to your consumers by July 1st, remember to:

- Send a copy to our office when you deliver it to your consumers, and
- Send a copy to your local health department when you deliver it to your consumers, and
- Post the CCR on the Internet if your water system serves 100,000 or more people, and
- Send us documentation certifying how you delivered the CCR. Certification of delivery is due to us by October 1st, but we encourage you to send it to us when you deliver the CCR by July 1st. You can download the *CCR Certificate of Distribution Form* from the Web page noted above.

Did you monitor for lead and copper in 2012, but forgot to provide individual lead tap results to the people at the sites that were sampled? You must say so on the CCR. We suggest a statement such as, "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."

Please contact us with your questions. We would like to be available to answer all your questions as you draft your CCR, but we have found that our office is inundated with questions as the deadline nears. You might be best served if you contact us before the end of May.

Failure to deliver the CCR by July 1st is a reporting violation and will result in an administrative fine. Contact our office for more information.



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

February 22, 2013

Mr. Robert Bisnick
Water Service Center
3310 East Court Street
Flint, MI 48506

WSSN: 02310
City Of Flint

Dear Mr. Bisnick:

SUBJECT: Drinking Water Monitoring Schedule – 2013
Annual Reports

Enclosed is your Drinking Water Monitoring Schedule for calendar year 2013 outlining the minimum requirements for your public water supply. Collect samples early in the monitoring period of the year indicated on the schedule. If you use a private laboratory you are required to report the results to us within the first ten days of the month following the month that you received the results. To receive credit for monitoring, the "**WSSN**" (water supply serial number), the "**Site Code**," and "**County**" must appear on the sample result. Bottles will NOT be mailed automatically. To order bottles, call the DEQ Laboratory at 517-335-8184. Be certain of the EPA sampling and analysis method requirements for hold times.

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

Also enclosed is the document "2013 Monitoring and Reporting Requirements." This provides additional details about monitoring and reporting requirements. If you have any questions, please contact us at the numbers below.

Sincerely,

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

Adam Rosenthal, EQA
Field Operation Section
Office of Drinking Water and
Municipal Assistance
517-335-6131

MFP:AR:JR

Enclosure
cc/encl: Mr. Brent Wright, W T P Supervisor

2013 Monitoring Schedule

FLINT, CITY OF
WSSN: 02310

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

Location: Distribution System

Sample Type	Collect Samples According to the ...	# Samples/ Frequency	Collect	Site Code	Fee	Unit Number	Test Code
Bacteriological – coliforms	TCR Sampling Site Plan	100/Monthly	Monthly	DIST	\$16.00	30	BPTC
Chlorine Residual	DBP Monitoring Plan	Measure the residual disinfectant level at the same point and at the same time as the bacteriological sample and report the average to the DEQ.					
Lead Copper for corrosion control	Lead and Copper Sampling Pool	23/36 months	Between 06/01 and 09/30/2014	DIST	\$26.00	36CC	CCUB
Water Quality Parameters	Representative Sites	10/3 months	Quarterly	DIST	Various	Various	Various
Total Trihalomethanes	DBP Monitoring Plan	2/3 months	Quarterly	DIST	\$65.00	36VO	CXTM
Haloacetic Acids		2/3 months	Quarterly	DIST	\$130.00	36HA	CXHA

*Need to revise
DBPR2 Monitoring
Plan
Reduced sites*





RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

TO: Water Supply Superintendent or Operator In Charge
FROM: Resource Management Division, Lansing District Office
DATE: May 16, 2012
SUBJECT: 2011 Consumer Confidence Report Reminder

Your annual Consumer Confidence Report (CCR) is due to be delivered by July 1st. Refer to last year's report and your most recent sample results when preparing this year's report. For more information on preparing your CCR, visit <http://michigan.gov/deq>. Click on Water, Drinking Water, Community Water Supply, and Consumer Confidence Report Rule. If you are a wholesaler, you should have provided monitoring results to the systems that retail your water by April 1st, or by the date you and your customers have agreed to, if earlier.

In addition to delivering your CCR to your consumers by July 1st, remember to:

- Send a copy to our office when you deliver it to your consumers, and
- Send a copy to your local health department when you deliver it to your consumers, and
- Post the CCR on the Internet if your water system serves 100,000 or more people, and
- Send us documentation certifying how you delivered the CCR. For example, enclose copies of newspaper articles, or lists of where you posted the CCR, or other documentation showing how it was delivered.

Certification of delivery is due to us by October 1st, but we encourage you to send it to us when you deliver the CCR by July 1st. You can download the *CCR Certificate of Distribution Form* from the web page noted above.

Did you monitor for lead and copper in 2011, but forgot to provide individual lead tap results to the people at the sites that were sampled? You must say so on the CCR. We suggest a statement such as, "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."

Are you scheduled to monitor for lead and copper in 2012? Remember to provide those results to the occupants of the homes tested, 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 within 3 months.

after the end of the monitoring period. You can download the *Lead and Copper Report and Consumer Notice of Lead Result Certificate* in Microsoft Word or PDF format from <http://michigan.gov/deq>. Click on Water, Drinking Water, Community Water Supply, and Reporting Forms.

Please contact us with your questions. We would like to be available to answer all your questions as you draft your CCR, but we have found that our office is inundated with questions as the deadline nears. You might be best served if you contact us before the end of May.

Your CCR must be received by our office no later than July 1st. Failure to deliver the CCR by July 1st is a reporting violation and will result in an administrative fine. Contact our office for more information.



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

February 17, 2012

Mr. Robert Bisnick
City Of Flint
1101 South Saginaw Street
Flint, Michigan 48502-1416

WSSN: 02310

Dear Mr. Bisnick:

SUBJECT: Drinking Water Monitoring Schedule – 2012
Annual Reports

2012 Monitoring Schedule

Enclosed is your Drinking Water Monitoring Schedule for calendar year 2012 outlining the minimum requirements of the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), and the administrative rules.

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

If you use a private laboratory please report the results to us within the first ten days of the month following the month that you sampled. A list of certified laboratories is available on request. If samples are not collected on or before the dates listed on your monitoring schedule, you will incur a monitoring violation and may also be subject to a fine. For information on the fines policy, visit <http://michigan.gov/DEQ>. Click on Water, Drinking Water, Community Water Supply, and Administrative Fines.

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

Mr. Robert Bisnick
February 17, 2012
Page 2

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

Special Instructions For Partial Chemistry, VOC and TTHM Samples: Please remember that these sample bottles must be cooled and properly preserved during shipment to the laboratory. If you use the DEQ laboratory, you will receive the ice pack, acid dropper (if necessary) and small cooler when you request the bottles. Please note that if you do not properly preserve your samples, they may not be used for compliance purposes and you may have to resample. If you would like more information or instructions on how to properly preserve your samples during shipment, please contact the DEQ lab, at 517-335-8184.

Groundwater Rule (GWR): The GWR went into effect in December 2009. All groundwater supplies were sent a letter in 2010 detailing their responsibilities. If you have any questions regarding the GWR, please contact us.

Reminder if Lead and Copper Monitoring Due This Year: Recent changes to the Lead and Copper Rule requires 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 within 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 www.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."

Annual Reports

Act 399 requires certain reports to be submitted to this office each year.

- The **Cross Connection Report**, due by March 31, describes the status of your local program. Manufactured housing communities are exempt until 2016.
- The **Annual Pumpage/Usage Report**, due by March 31, is required of water supplies that do not submit monthly operation reports.

Mr. Robert Bisnick
February 17, 2012
Page 3

- The **Consumer Confidence Report**, is due to your customers, to your local health department and to this office by July 1.

To download the Cross Connection or Annual Pumpage forms in Microsoft Word or PDF format, visit <http://michigan.gov/deq>. Click on Water, Drinking Water, Community Water Supply, and Reporting Forms. This office can provide a CCR template.

If you have any questions about the requirements or filling out the forms, please call us at the numbers below.



Michael F. Prysby, P.E., District Engineer
Field Operation Section
RMD
517-335-6122



Adam Rosenthal, EQA
Field Operation Section
RMD
517-335-6131

MFP:AR:JR
Enclosure
cc/encl: Mr. Brent Wright, W T P Supervisor



2012 Monitoring Schedule

FLINT, CITY OF

WSSN: 02310

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

Location: Distribution System

Sample Type	Collect Samples According to the ...	# Samples/ Frequency	Collect	Site Code	Fee	Unit Number	Test Code
Bacteriological – coliforms	TCR Sampling Site Plan	100/Monthly	Monthly	DIST	\$16.00	30	BPTC
Chlorine Residual	DBP Monitoring Plan	Measure the residual disinfectant level at the same point and at the same time as the bacteriological sample and report the average to the DEQ.					
Lead Copper for corrosion control	Lead and Copper Sampling Pool	23/36 months	Between 06/01 and 09/30/2014	DIST	\$26.00	36CC	CCUB
Water Quality Parameters	Representative Sites	10/3 months	Quarterly	DIST	Various	Various	Various
Total Trihalomethanes*	DBP Monitoring Plan (paired samples at same time and place)	4/3 months	Quarterly	DIST	\$65.00	36VO	CXTM
Haloacetic Acids*		4/3 months	Quarterly	DIST	\$130.00	36HA	CXHA

* NOTE: This TTHM/HAA5 monitoring schedule reflects Stage 1 Disinfectants and Disinfection Byproducts (DDBP) Rule requirements. During 2012, the Stage 2 DDBP Rule will take effect for your system. DEQ will soon contact you about revising your DDBP Monitoring Plan to reflect Stage 2 DDBP requirements.





RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

August 26, 2011

TO: Water Supply Superintendent or Operator In Charge

SUBJECT: 2011 Drinking Water System Monitoring – Reminder

This is just a friendly reminder that drinking water monitoring is due by September 30, 2011. This is not a notice of violation. Contacting water systems provides the Department of Environmental Quality (DEQ) a chance to remind supplies of upcoming deadlines, and allows supplies the chance to verify that their records for submitted sample results match what the DEQ has received.

According to our records, not all drinking water monitoring has been performed as outlined in the 2011 Monitoring Schedule sent to you earlier this year. Please refer to the enclosed monitoring schedule to view the sampling for which we have not yet received laboratory results. If you have results for monitoring listed in the schedule, please provide a copy to this office.

If monitoring has not yet been completed, please collect the required sample(s) no later than **September 30, 2011**, unless otherwise noted, to avoid monitoring violations, public notice requirements, and administrative fines of at least \$200.00. If you use a private laboratory to analyze your samples, you must provide this office with copies of the results by October 10, 2011.

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

Reminder if Lead and Copper Monitoring Due This Year: Recent changes to the Lead and Copper Rule requires you to provide individual lead tap results, within 30 days of learning of results, to people who receive water from sites that were sampled, even if lead was not detected. You must also send us a certification that you met all the delivery requirements along with a sample copy of your customer notice within 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>. Under Environmental Services, click on Water, Drinking Water, Community Water Supply, and Reporting Forms.

If you have any questions or believe that the enclosed monitoring schedule is not accurate, please contact Adam Rosenthal at 517-335-6131 or rosenthala@michigan.gov, or you may contact your district engineer:

Michael Prysby at 517-335-6122 or prysbym@michigan.gov – Genesee & Lapeer Co.
Bethel Skinker at 517-335-6127 or skinkerb@michigan.gov – Eaton, Ingham & Shiawassee Co.
Mark Joseph at 517-335-6349 or josephm@michigan.gov – Clinton, Gratiot & Livingston Co.



2011 Monitoring Schedule

FLINT, CITY OF
WSSN: 02310

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

Location: Distribution System

Sample Type	Collect Samples According to the ...	# Samples/ Frequency	Collect	Site Code	Fee	Unit Number	Test Code
Bacteriological – coliforms	TCR Sampling Site Plan	100/Monthly	Monthly	DIST	\$16.00	30	BPTC
Chlorine Residual	DBP Monitoring Plan	Measure the residual disinfectant level at the same point and at the same time as the bacteriological sample and report the average to the DNRE.					
Lead/Copper for corrosion control	Lead and Copper Sampling Pool	23/36 months	Between 06/01 and 09/30/2011	DIST	\$26.00	36CC	CCUB
Water Quality Parameters	Representative Sites	10/3 months	Quarterly	DIST	Various	Various	Various
Total Trihalomethanes	DBP Monitoring Plan (paired samples at same time and place)	4/3 months	Quarterly	DIST	\$65.00	36VO	CXTM
Haloacetic Acids		4/3 months	Quarterly	DIST	\$130.00	36HA	CXHA



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

TO: Water Supply Superintendent or Operator In Charge
FROM: Resource Management Division, Lansing District Office
DATE: May 31, 2011
SUBJECT: 2011 Consumer Confidence Report Reminder

As you prepare your Consumer Confidence Report (CCR), summarizing information about the drinking water quality served during calendar year 2010, we want to remind you of some of the requirements. Refer to last year's report and your most recent sample results when putting this year's report together. **The CCR must be delivered to your customers, the local health department, and our office by July 1st.** If you are a wholesaler, you should have provided monitoring results to the systems that retail your water by April 1st or by the date you and your customers have agreed to, if earlier.

In addition to delivering your CCR to your consumers by July 1st, remember to:

- Send a copy to our office when you deliver it to your consumers, and
- Send a copy to your local health department when you deliver it to your consumers, and
- Post the CCR on the internet if your water system serves 100,000 or more people, and
- Send us documentation certifying how you delivered the CCR. For example, enclose copies of newspaper articles, or lists of where you posted the CCR, or other documentation showing how it was delivered.

Certification of delivery is due to us by October 1st, but we encourage you to send it to us when you deliver the CCR by July 1st. To download the *CCR Certificate of Distribution Form*, visit <http://michigan.gov/deq>. Under Environmental Services, click on Water, Drinking Water, Community Water Supply, and Consumer Confidence Report Rule. We also encourage you to read *Preparing Your CCR* found on the same Web page.

Disinfection Byproduct and *Cryptosporidium* Monitoring: If you monitored in 2010 for the disinfection byproducts, total trihalomethanes and haloacetic acids, or *Cryptosporidium* under the new federal regulations, you must include detections of this monitoring with an explanation.

Water Supply Superintendent or Operator In Charge

Page 2

May 31, 2011

New Language for Lead: Beginning in 2010, every CCR must include information about lead, *even if monitoring for lead was not conducted*. Delete any lead language you have used in the past and include the following new language:

New lead language: 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. [NAME OF UTILITY] 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 or at <http://www.epa.gov/safewater/lead>.

Reminder if Lead and Copper Monitoring Due This Year: Recent changes to the Lead and Copper Rule requires 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 within 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/dnre>. Under Environmental Services, click on Water, Drinking Water, Community Water Supply, and Reporting Forms.

Please contact us with your questions. We would like to be available to answer all your questions as you draft your CCR, but we have found that our office is inundated with questions as the deadline nears. You might be best served if you contact us before the end of May.

Public water system monitoring and reporting violations, including failure to post public notices, are covered in our fines policy. Failure to deliver the CCR by July 1st is a reporting violation and may result in a fine. Contact our office if you would like a summary of our fines policy.



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT
LANSING



February 28, 2011

Mr. Tom Mc Cabe
City Of Flint
1101 South Saginaw Street
Flint, Michigan 48502-1416

WSSN: 02310

Dear Mr. Mc Cabe:

SUBJECT: Drinking Water Monitoring Schedule – 2011
Annual Reports

2011 Monitoring Schedule

Enclosed is your Drinking Water Monitoring Schedule for calendar year 2011 outlining the minimum requirements of the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), and the administrative rules.

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

If you use a private laboratory please report the results to us within the first ten days of the month following the month that you received the analysis. A list of certified laboratories is available on request. If samples are not collected on or before the dates listed on your monitoring schedule, you will incur a monitoring violation and may also be subject to a fine. For information on the fines policy, visit <http://michigan.gov/dnre>. Under Environmental Services, click on Water, Drinking Water, Community Water Supply, and Administrative Fines.

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

Mr. Tom Mc Cabe
February 28, 2011
Page 2

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

Special Instructions For Partial Chemistry, VOC and TTHM Samples: Please remember that these sample bottles must be cooled and properly preserved during shipment to the laboratory. If you use the DNRE laboratory, you will receive the ice pack, acid dropper (if necessary) and small cooler when you request the bottles. Please note that if you do not properly preserve your samples, they may not be used for compliance purposes and you may have to resample. If you would like more information or instructions on how to properly preserve your samples during shipment, please contact the DNRE lab, at 517-335-8184, or contact me.

Groundwater Rule (GWR): The GWR went into effect in December, 2009. All groundwater supplies were sent a letter in 2010 detailing their responsibilities. If you have any questions regarding the GWR, please contact me.

Reminder if Lead and Copper Monitoring Due This Year: Recent changes to the Lead and Copper Rule requires 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 within 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 www.michigan.gov/dnre. Under Environmental Services, click on Water, Drinking Water, Community Water Supply, and Reporting Forms.

Annual Reports

Act 399 requires certain reports to be submitted to this office each year.

- The **Cross Connection Report**, due by March 31, describes the status of your local program. Manufactured housing communities are exempt until 2016.
- The **Annual Pumpage/Usage Report**, due by March 31, is required of water supplies that do not submit monthly operation reports.

Mr. Tom Mc Cabe
February 28, 2011
Page 3

- The **Consumer Confidence Report**, due by July 1, is due to your customers, to your local health department and to this office by July 1.

To download the Cross Connection or Annual Pumpage forms in Microsoft Word or PDF format, visit <http://michigan.gov/dnre>. Under Environmental Services, click on Water, Drinking Water, Community Water Supply, and Reporting Forms. This office can provide a CCR template.

If you have any questions about the requirements or filling out the forms, please call me at the number below.



Michael F. Prysby, P.E., District Engineer
Field Operation Section
ERMD
517-335-6122



Adam Rosenthal, EQA
Field Operation Section
ERMD
517-335-6131

MFP:AR:JR
Enclosure

cc/encl: Mr. Brent Wright, W T P Supervisor

2011 Monitoring Schedule

FLINT, CITY OF
WSSN: 02310

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

Location: **Distribution System**

Sample Type	Collect Samples According to the ...	# Samples/ Frequency	Collect	Site Code	Fee	Unit Number	Test Code
Bacteriological – coliforms	TCR Sampling Site Plan	100/Monthly	Monthly	DIST	\$16.00	30	BPTC
Chlorine Residual	DBP Monitoring Plan	Measure the residual disinfectant level at the same point and at the same time as the bacteriological sample and report the average to the DNRE.					
Lead Copper for corrosion control	Lead and Copper Sampling Pool	23/36 months	Between 06/01 and 09/30/2011	DIST	\$26.00	36CC	CCUB
Water Quality Parameters	Representative Sites	10/3 months	Quarterly	DIST	Various	Various	Various
Total Trihalomethanes	DBP Monitoring Plan (paired samples at same time and place)	4/3 months	Quarterly	DIST	\$65.00	36VO	CXTM
Haloacetic Acids		4/3 months	Quarterly	DIST	\$130.00	36HA	CXHA



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

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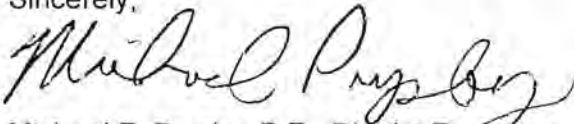
September 2, 2015

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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

May 11, 2015

Mr. Howard Kroft, Director of Public Works
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502

WSSN: 02310

Dear Mr. Kroft:

SUBJECT: Flint Cross Connection Control Program

This letter confirms my site visit on April 29, 2015, with Mr. Glen Thomas, Utilities/Cross Connection Division Inspector for the city of Flint. Mr. Stephen Busch from our office was also present. The purpose of the visit, in part, was to discuss the city's Cross Connection Control Program (CCCP).

The city of Flint has made significant progress in recent years regarding the implementation of the city's approved CCCP. This effort has included identification of accounts, inspection and re-inspection of accounts at the approved frequencies, and ensuring the testing of backflow prevention assemblies in accordance with approved frequencies. However, the city's most recent report of annual CCCP activities for 2014 indicates a significant decrease in these activities below minimum requirements, and this deficiency must be address.

Our office fully recognizes the recent staffing loss of the city's previous plumbing inspector and the importance of these plumbing inspection services in providing public health protection, but these activities should not be borne at the cost of the city's CCCP and the protections it provides. Given the bacterial detections that occurred in the city's water distribution system in August and September 2014, along with customer complaints regarding aesthetic water quality, the need for protection through cross connection control are very evident.

We also realize that implementing a CCCP of for a community water system of this magnitude requires a significant commitment of time and personnel. We encourage the city to review CCCP staffing needs and authorize the workforce necessary to comply with the city's approved CCCP requirements.

Mr. Howard Kroft

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May 11, 2015

Should you require further information, please contact me at the telephone number below; via e-mail at prysbym@michigan.gov; or Department of Environmental Quality, P.O. Box 30242, Lansing, Michigan 48909.

Sincerely,



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

mfp/jlr

cc: Mr. Glen Thomas, City of Flint
Mr. Stephen Busch, P.E.



DEPARTMENT OF UTILITIES
Water Plant & Facilities

Dayne Walling
Mayor

Gerald Ambrose
Emergency Manager

Brent Wright
Supervisor

April 10, 2015

Michael F. Prysby, P.E., District Engineer
Michigan Department of Environmental
Quality
525 W. Allegan Street
P.O. Box 30242
Lansing, MI 48909-7742

DEO
APR 13 2015
LANSING DISTRICT

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

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.

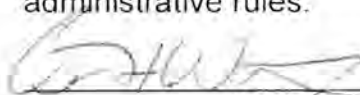
This notice is being sent to you by the City of Flint.

CERTIFICATION: F2.33

LANSING DISTRICT

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


Supervisor
Title

4-1-2015
Date Distributed

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





Water Quality Update



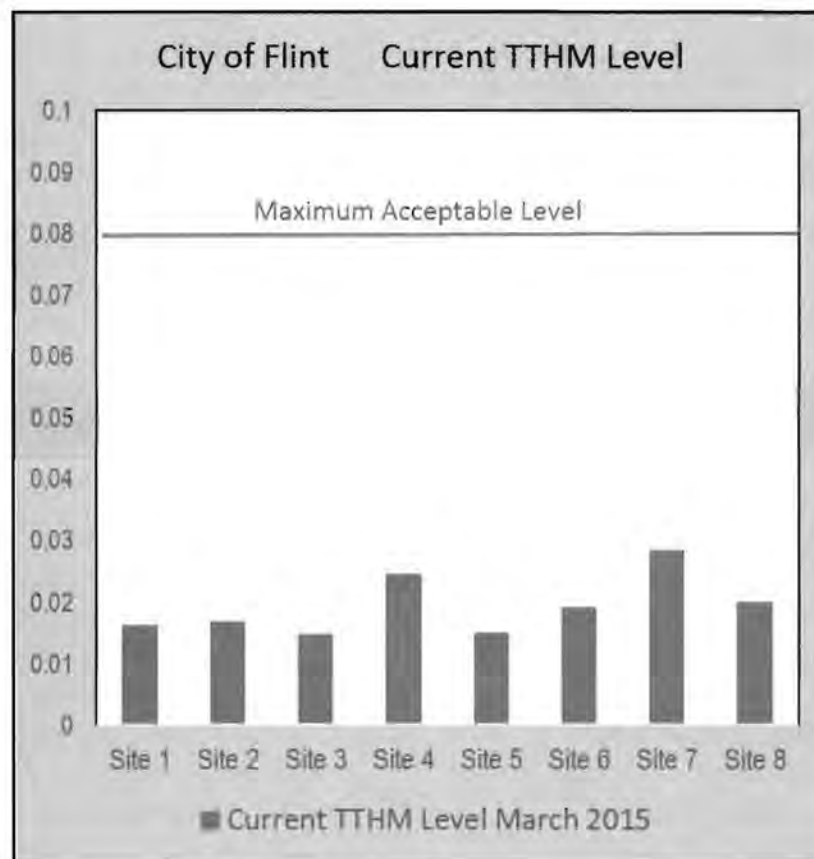
City of Flint Resident:

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:





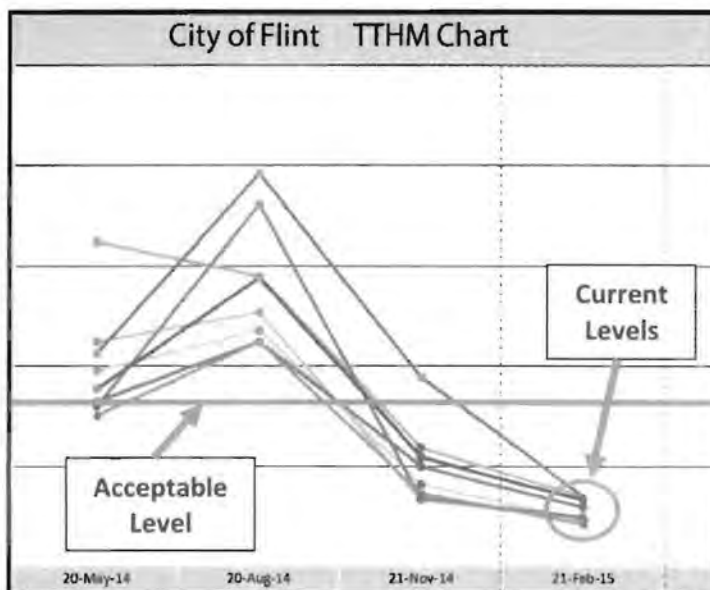
Water Quality Update



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 TTHM is 80 micro grams per liter (ug/L). The location reporting the highest TTHM level was 105 ug/L; thus, our water system exceeds the TTHM MCL.

What should I do?

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

What does this mean?

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

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

What is being done?

We are currently working on solutions to correct the problem. We anticipate resolving the problem in 2015. Our most recent individual sample results were all less than half the 80 ug/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 810-787-6537, or the Flint Water Plant at 4500 North Dart 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.

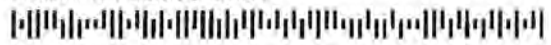
This notice is being sent to you by the City of Flint.

P55 T51 *****AUTO**5-DIGIT 48505 20254

CURRENT RESIDENT

[REDACTED]

FLINT MI 48505-2401





RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

April 3, 2015

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

Dear: Mr. Wright

SUBJECT: Long Term 2 Enhanced Surface Water Treatment Rule (LT2 Rule)
2nd Round of Source Water Monitoring Requirements

The LT2 Rule was promulgated by the United States Environmental Protection Agency on January 5, 2006. The Department of Environmental Quality (DEQ) adopted this rule into the Administrative Rules in December, 2009. All public water systems that are supplied by a surface water source, and systems supplied by a ground water source under the direct influence of surface water (GWUDI), are subject to this rule.

According to the LT2 Rule, systems are required to conduct an initial and a second round of source water monitoring for each plant that treats a surface water or GWUDI source. Please keep in mind that grandfathering data will not be accepted for the second round of monitoring. This monitoring includes at least one source water *Cryptosporidium*, *E. coli*, and turbidity sample per month for a period of 24 months for systems serving populations greater than 10,000 people. Systems will be assigned to a "treatment bin" based on the results of source water monitoring. The treatment bin specifies the level of *Cryptosporidium* removal and/or inactivation that the system must achieve.

Our records indicate that your system is required to comply with the source water monitoring requirements on Schedule 2 as stated below in Table 1. Therefore, your system is required to submit to the DEQ, a source water monitoring plan for each plant by July 1, 2015, and start the 2nd round of monitoring in October, 2015.

Table 1 – LT2 Milestone Dates for 2nd Round of Source Water Sampling

System Population	Schedule	Must submit Source Water Sampling Plan by...	Must begin second round of source water monitoring...
At least 100,000	1	January 1, 2015	April 1, 2015
50,000 – 99,999	2	July 1, 2015	October 1, 2015
10,000 – 49,999	3	July 1, 2016	October 1, 2016
<10,000	4	July 1, 2017	October 1, 2017

Mr. Brent Wright

2

April 3, 2015

Enclosed with this letter is a Source Water Sampling Plan template that you can complete and submit to this office to comply with the July 1, 2015, deadline. The template includes instructions and a worksheet that will assist the DEQ in determining if your plan meets the requirements of the LT2 Rule.

If you have any questions about this subject, feel free to contact me at 517-290-8817; prysbym@michigan.gov; or Department of Environmental Quality, Office of Drinking Water and Municipal Assistance, Lansing District Office, 525 West Allegan Street, 1st Floor South, P.O. Box 30242, Lansing, Michigan 48909-7742.

Sincerely,



Michael F. Prysby, P.E.

District Engineer

Field Operations Section

Office of Drinking Water and

Municipal Assistance

Enclosures

cc: Mr. Howard Kroft, City of Flint



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

March 7, 2015

Mr. Daugherty Johnson
Utilities Administrator
City of Flint
1101 S. Saginaw Street
Flint, MI 48502

Reference: **24-inch Transmission Water Main Replacement Project – Water Main Sizing and Detention Time**

Dear Mr. Johnson:

In accordance with the City of Flint's (City's) request, Lockwood, Andrews & Newnam, Inc. (LAN) performed hydraulic modeling to evaluate downsizing the existing 24-inch transmission water main constructed primarily along Dupont Street, Bishop Avenue, and Wager Avenue from Flushing Road to Wager Avenue and the existing 30-inch transmission water main from Water Avenue to the Water Treatment Plant. The existing 16-inch from University Avenue to Flushing Road was assumed to be replaced with new 16-inch piping.

Distribution main connections to the replacement transmission water main were considered at the following intersections:

1. Dupont Street and Flushing Road
2. Seminole Street and Copeman Boulevard
3. Iroquois Avenue at W. Paterson Street
4. Iroquois Avenue and Green Street
5. Iroquois Avenue and W. Dayton Street
6. Iroquois Avenue and W. McClellan Street
7. Dupont Street and W. Pasadena Avenue
8. Dupont Street and W. Myrtle Avenue
9. Dupont Street and W. Stewart Avenue
10. W. Bishop Avenue and M.L. King Avenue
11. Wager Avenue and N. Saginaw Street
12. Wager Avenue and Industrial Avenue

Two flow conditions were modeled for the assessment:

1. A system demand of 24 MGD.
2. A system demand of 24 MGD with a 3,500 gpm fire flow over a 4 hour period at the intersection of Euclid Boulevard and Stockdale Street.

Model results indicated the existing 24-inch water main can be replaced with a 20-inch from Flushing Road to the Water Treatment Plant. System pressures were maintained near or above 40-psi for both flow conditions with the proposed 20-inch water main.

Steady state analyses were performed to assess the detention time in the existing 24-inch and proposed 20-inch water mains. An average system demand 15 MGD was used for these analyses. The approximate detention time for water to travel from the Water Treatment Plant to Flushing Road was approximately 13 hours for a 24-inch pipe and 12 hours for a 20-inch pipe.

Mr. Daugherty Johnson
City of Flint
March 7, 2015
Page 2

Water age analyses were also investigated. The water age analyses used a system demand of 15 MGD to evaluate the maximum water age. While some areas of the system showed no improvement, there were areas of the system where the water age reduced by approximately one day with the proposed 20-inch.

Sincerely,

Melissa C. Mack

Melissa C. Mack, P.E.
Project Manager

MCM:ecm

Enclosures: Exhibit A – 24-inch Water Main Water Age Map
Exhibit B – 20/16-inch Water Main Water Age Map

Cc: LAN - Warren Green, P.E.; Jeremy Nakashima, P.E.; Samir Malta, P.E.



DEPARTMENT OF UTILITIES
Water Plant & Facilities

Dayne Walling
Mayor

Darnell Earley
Emergency Manager

Brent Wright
Supervisor

January 9, 2015

DEQ
RESOURCE MANAGEMENT DIVISION

JAN 13 2015

LANSING DISTRICT

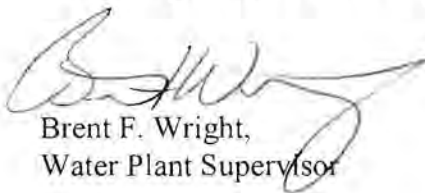
Michael F. Prysby, P.E., District Engineer
Michigan Department of Environmental
Quality
525 W. Allegan Street
P.O. Box 30242
Lansing, MI 48909-7742

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 Friday January 2, 2015. The notification was publicized in The Flint Journal under public notifications on Tuesday January 6, 2015. The notification letter was also uploaded on the City's website www.cityofflint.com/wp-content/uploads/TTHM-notification.pdf. A copy of the letter and newspaper ad are 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



IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

City of Flint Did Not Meet Treatment Requirements

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

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

What should I do?

- There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. In that case, you may be at increased risk and should seek advice about drinking water from your health care provider.
- 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.

For more information, please contact Mr. Brent Wright or Mike Glasgow at 810-787-6537 or the Water Plant at 4500 North Dort Highway, Flint, MI 48505.

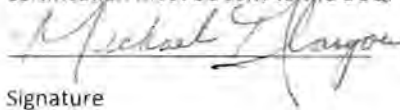
Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by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

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

CERTIFICATION: F1 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. Reminder to water supplier: This notice/certification must be sent to the DEQ.

 ASSISTANT SUPERVISOR 1/2/15
Signature Title Date Distributed



Searching for that perfect item

Classified

PAGE C7 / THE FLINT JOURNAL / TUESDAY, JANUARY 6, 2015



C7

ANNOUNCEMENTS

Music
Sound



C7

MERCHANDISE

Antiques
Appliances
Garage Sales



C7

FINANCE

Investment
Stocks
Mortgages



PUBLIC NOTICES

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER City of Flint Did Not Meet Treatment Requirements

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

We routinely monitor for the presence of drinking water contaminants. Samples were collected for total trihalomethanes (TTHM) analysis from eight locations on a quarterly basis (May 21, August 21, and November 20 of 2014). The average of the results at ANY of the eight locations must not exceed the maximum contaminant level (MCL) for TTHMs, otherwise our water system exceeds the Maximum Contaminant Level (MCL). The standard for TTHMs is 80 ug/L. The location reporting the highest TTHM level was 99 ug/L; thus, our water system exceeds the T-HM 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, in that case, you may be at increased risk and should seek advice about drinking water from your health care provider.
- 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.

For more information, please contact Mr. Brent Wright or Mike Glasgow at 810-787-6537 or the Water Plant at 4500 North Dort Highway, Flint, MI 48905.

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: FI 53
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. Reminder to water supplier: This notice/certification must be sent to the DEQ.

Michael Glasgow
Assistant Supervisor
Date Distributed: 1/2/2015

02310



DEPARTMENT OF UTILITIES
Water Plant & Facilities

Dayne Walling
Mayor

Darnell Earley
Emergency Manager

Brent Wright
Supervisor

October 31, 2014

Michael F. Prysby, P.E., District Engineer
Michigan Department of Environmental
Quality
525 W. Allegan Street
P.O. Box 30242
Lansing, MI 48909-7742

DEQ
RESOURCE MANAGEMENT DIVISION
NOV 03 2014
LANSING DISTRICT

Dear Mr. Prysby:

This letter is to inform your office the City of Flint Water Treatment Plant made public the MCL of Total Coliform for the month of September 2014. The notification was publicized in The Flint Journal under public notifications on Sunday October 26, 2014. The notification letter was also uploaded on the City's website www.cityofflint.com/financialMgt/images/wateradvisory2014/violationnotification.pdf.

I believe this will satisfy are requirements under administrative rule R 325.10403.

If anything further is necessary, please contact me at here at the plant, 810.787.6537.

Brent F. Wright,
Water Plant Supervisor

cc: File

Important Information About Your Drinking Water

Tests showed coliform bacteria in the City of Flint water

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 did to correct the situation.

We routinely monitor for drinking water contaminants. We took 150 samples to test for the presence of coliform bacteria during September 2014. 15 of those samples (10%) showed the presence of coliform bacteria. The standard is that no more than 5 percent of our samples may do so.

What should I do?

You do not need to boil your water or take other corrective actions. However, if you have specific health concerns, consult your doctor. People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their healthcare providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1-800-426-4791.

What does this mean?

This is not an emergency. A portion of the City was notified to boil their water at the time of the incident until it was resolved. Coliform bacteria are generally not harmful themselves.

Coliforms are bacteria which are naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present. Coliforms were found in more samples than were allowed and this was a warning of potential problems.

Usually, coliforms are a sign that there could be a problem with the system's treatment or distribution system (pipes). Whenever we detect coliform bacteria in any sample, we do follow-up testing to see if other bacteria of greater concern, such as fecal coliform or E. coli, are present. We did not find any of these bacteria in our subsequent testing, and further testing shows that this problem has been resolved.

What happened? What was done? On September 5, 2014, after routine and repeat samples showed the presence of total coliform, a boil water order was issued to the affected area. That area was flushed and resampled until samples were non-detect for total coliform. The boil order was lifted on September 9, 2014. Samples collected since then show that all results met acceptable limits.

For more information, please contact Mr. Brent Wright, Water Plant Supervisor, City Of Flint - DPW at 810.787.6537 ext. 3510 or Flint Water Plant - 4500 North Dort Highway, Flint, MI 48505.

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

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

DEQ
RESOURCE MANAGEMENT DIVISION

NOV 03 2014

CERTIFICATION: F2, S3

WSSN: 02310

LANSING DISTRICT

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

10-23-14
Date Distributed

(Reminder to water supplier) This notice / certification must be sent to the DNRE

Newspaper

185
WSSN 2310
Corresp

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

OCT 20 2014

REPLY TO THE ATTENTION OF:

DEQ
RESOURCE MANAGEMENT DIVISION

OCT 27 2014

Ms. Tokoya Cureton
324 West Jackson Avenue
Flint, MI 48505

LANSING DISTRICT

Dear Ms. Cureton:

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

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

Your letter referred to "bad water quality" since the switch to using Flint River water as Flint's source of drinking water. My staff contacted the MDEQ District Engineer, Mike Prysby, to discuss the Flint drinking water issues. Mr. Prysby is aware of the multiple complaints from citizens and is working closely with the Flint Water Department to ensure the distribution system and the water treatment processes work more efficiently and more effectively. The MDEQ contacted the Flint Water Department to discuss your concerns and your contact information was provided to them. The Water Department will be flushing water mains and fire hydrants in your neighborhood. For further information, you can contact Mr. Prysby at:

Mike Prysby, District Engineer
Michigan Department of Environmental Quality
Office of Drinking Water and Municipal Assistance, Lansing District Office
P.O. Box 30242
Lansing, Michigan 48909-7742
(517) 290-8817
prysbym@michigan.gov

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

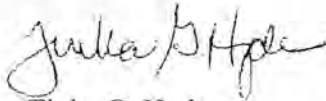
Telephone numbers for you to call if you have further concerns:

Flint Water Service Center deals with problems in the distribution system: 810-766-7202

Water Treatment Plant deals with the actual treatment of the water prior to its pumping into the distribution system: 810-787-6537

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

Sincerely,



Tinka G. Hyde
Director, Water Division

cc: Mike Prysby, MDEQ
Steve Busch, MDEQ



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

TO: Water Supply Superintendent or Operator-In-Charge

FROM: Office of Drinking Water and Municipal Assistance, Lansing District Office

DATE: June 12, 2014

SUBJECT: 2013 Consumer Confidence Report Reminder

Your annual Consumer Confidence Report (CCR) is due to be delivered by July 1st.

You may use any combination of mail, door-to-door, or electronic methods to deliver to bill paying customers. This means you may mail and/or e-mail a message that the CCR is available on the internet or attached to the e-mail. If using the internet, the CCR must be on the internet when customers receive the message and the internet address displayed in the message must lead directly to the entire CCR. The message should tell customers how to request a paper copy. If you normally publish a non-English language CCR, then the notification of CCR availability should also be in that language.

Refer to last year's report and your most recent sample results when preparing this year's report. For more information on preparing your CCR, visit <http://michigan.gov/deq>. Click on Water, Drinking Water, Community Water Supply, and Consumer Confidence Report Rule.

In addition to delivering your CCR to your consumers by July 1st, remember to send a copy to us and to your local health department. Also send us documentation certifying how you delivered the CCR. Certification of delivery is due to us by October 1st, but we encourage you to send it to us when you deliver the CCR by July 1st. You can download the *CCR Certificate of Distribution Form* from the Web page noted above.

Did the United States Environmental Protection Agency (U.S. EPA) direct you to monitor for unregulated contaminants during 2013? Report the average and range of each contaminant detected. Also, provide an explanation of this required monitoring, such as, "Unregulated contaminants are those for which the U.S. EPA has not established drinking water standards. Monitoring helps the U.S. EPA to determine where certain contaminants occur and whether it needs to regulate those contaminants. We monitored for these contaminants and results of monitoring are available on request."

Please contact us with your questions. We would like to be available to answer all your questions as you draft your CCR, but we have found that our office is inundated with questions as the deadline nears. You might be best served if you contact us early.

Failure to deliver the CCR by July 1st is a reporting violation and will result in an administrative fine. Contact our office for more information.



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

May 28, 2014

Ms. Sue F. McCormick, Director
Detroit Water and Sewerage Department
735 Randolph Street
Detroit, Michigan 48226

DEQ
RESOURCE MANAGEMENT DIVISION
JUN 03 2014
LANSING DISTRICT

Dear Ms. McCormick:

SUBJECT: City of Flint Reliability

Thank you for your May 9, 2014, letter regarding redundancy options for the city of Flint. Enclosed with this letter is a copy of the correspondence provided to Flint to verify that the city complies with the reliability requirements of the Safe Drinking Water Act, 1976 PA 399, as amended. As this correspondence indicates, the city currently meets the statutory requirements for reliability and capacity.

Although the city meets statutory requirements, we have encouraged them to establish mutual aid agreements with adjacent water systems that could maintain interconnections for emergency purposes as an additional public health protection measure.

Should you require further information, please contact Mr. Stephen Busch, Lansing/Jackson District Supervisor, Field Operations Section, Office of Drinking Water and Municipal Assistance (ODWMA), at 517-643-2314; buschs@michigan.gov; or at Department of Environmental Quality (DEQ), ODWMA, P.O. Box 30242, Lansing, Michigan 48909-7742.

Sincerely,

Dan Wyant
Director
517-284-6700

Enclosure

cc: Mr. Jim Sygo, Deputy Director, DEQ
Ms. Liane Shekter Smith, DEQ
Mr. Richard Benzie, DEQ
Mr. Stephen Busch, DEQ



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

May 20, 2014

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

WSSN: 02310

Dear: Mr. Wright

Subject: Water Treatment Plant (WTP) Fluoridation

This letter, per your request, is being written to confirm the Department of Environmental Quality's (DEQ) position concerning the suspension of the application of fluoride until June 2014. Fluoridation was instituted in Flint approximately 50 years ago in order to increase the level of dental health protection.

While the DEQ supports fluoridation as the primary means to provide optimal dental health protection, we concur with the temporary interruption in fluoridation. This will allow WTP operators to focus on meeting the regulated drinking water standards and to increase proficiency in full-time WTP operation. The public health benefit of fluoridation is gained with long-term use and is not immediately compromised by a short-term interruption in application.

The focus on WTP operation is essential in meeting the regulated drinking water standards; thus, the city may suspend fluoridation until June 1, 2014. Please contact our office if fluoridation cannot resume by this date.

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,

Michael F. Prysby, P.E.
District Engineer
Field Operations Section
Office of Drinking Water and
Municipal Assistance

mfp/jlr

cc: Mr. Howard Kroft, Utilities Director, City of Flint



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

April 29, 2014

Mr. Daugherty Johnson, Utilities Administrator
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502

WSSN: 02310

Dear: Mr. Johnson

Subject: Act 399 Capacity and Reliability Requirements

This letter, per your request, is being written as verification that the City of Flint water system is currently in compliance with required capacity and power service reliability requirements under the Michigan Safe Drinking Water Act and Administrative Rules, Supplying Water to the Public.

The required capacity of a waterworks system as established in Rule 1204 (R 325.11204) required sufficient capacity to meet approved finished water supply requirements, and is based upon the combination of the following options:

- a. Rated capacity of an approved surface water supply or complete treatment system;
- b. Firm capacity of approved groundwater supply;
- c. Available contracted capacity that can be delivered from another public water supply;
- d. Excess finished water storage capacity.

Under the first option listed above, the City's baseline water withdrawal capacity from the Flint River, and rated capacity of the City's water treatment plant (WTP), both exceed its finished water supply requirements. The rated capacity of a complete treatment system is established under Rule 1006 (R 325.11006). In accordance with this rule, the Department of Environmental Quality (DEQ) has established a rated capacity of 36 million gallons per day for the City's WTP, which again far exceeds current and future finished water supply requirements for the City's service area.

In addition, while capacity under item d above for excess finished water storage has not been established, the City currently has enough finished water storage to supply more than 2 days of normal finished water supply requirements

Rule 1206 (R 325.11206) requires water systems to provide a means to continuously supply fully finished water during normal power service interruption. The City's WTP is now equipped with a redundant electrical system that includes provisions for stand-by power generation; thus meeting this requirement.

While additional means to meet the above requirements for capacity and power interruption can be provided through contracted interconnections with other water systems, the City has demonstrated compliance with these requirements without such means. However, the DEQ still supports and encourages such interconnections be maintained for emergency purposes as an additional barrier to help maintain public health protections. While these emergency

Mr. Daugherty Johnson

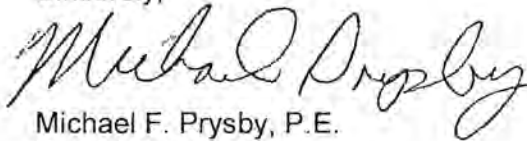
2

April 29, 2014

interconnections have no requirement to establish an available or contracted capacity, the DEQ encourages the corresponding utilities to establish mutual aid agreements where possible. Such agreements can be developed through the Michigan Water/Wastewater Agency Response Network (MiWARN). For more information, please visit miwarn.org. A MiWARN brochure is also enclosed for your information.

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,



Michael F. Prysby, P.E.
District Engineer
Field Operations Section
Office of Drinking Water and
Municipal Assistance

mfp/jlr
Enclosure

cc: Mr. Howard Kroft, Utilities Director, City of Flint



Dayne Walling
Mayor

City of Flint

Utilities Division



Darnell Earley
ICMA-CM, MPA
Emergency Manager

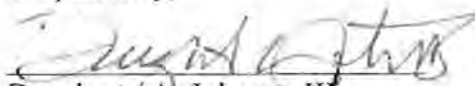
April 28, 2014

Lansing District Supervisor
OWMRP, DEQ
PO Box 30242
Lansing, MI 48909-7742

Subject: Consent Order: City of Flint 5200 Bray Rd. OWMRP Order No. 115-01-14

In accordance with the above listed Consent Order, Section VII Retention of Records. The City of Flint hereby notifies the DEQ that all records, plans, logs and other documents required to be maintained under this Consent Order shall be located at the City of Flint Water Treatment Plant 4500 N. Dort Hwy Flint, MI 48505.

Respectfully,


Daugherty A. Johnson III
Utilities Administrator
City of Flint

DEQ
RESOURCE MANAGEMENT DIVISION

MAY 02 2014

LANSING DISTRICT

Prysby, Mike (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, March 20, 2013 12:10 PM
To: 'Daugherty Johnson'
Cc: bwright@cityofflint.com; Shekter Smith, Liane (DEQ); Bloemker, Jon (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ)
Subject: KWA Raw Water Capacity - City of Flint

Daugherty,

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

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

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

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

- Flint has the potential to fill many existing industrial vacancies over the next 20 years. Additional capacity will be needed to meet this need.
- Potential permit bans and/or connection bans if MDD cannot be met under contracted capacity
- Water use restrictions measures if MDD cannot be met

- Flint needs to plan for future capacity requirements. Most future capacity plans allow for some increase in capacity to allow for expansion of residential, commercial, or industrial customer base
- Flint's 2011 Water Reliability Study's 2030 projected MDD is 24.0 MGD. This MDD is consistent with Flint's most recent water system Sanitary Survey prepared by the MDEQ.

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

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

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

Prysby, Mike (DEQ)

From: Dean Oparka <DOparka@rowepsc.com>
Sent: Monday, March 04, 2013 1:21 PM
To: Prysby, Mike (DEQ)
Cc: Jeff Markstrom
Subject: Flint 30 & 24-inch WM

Mike,

In response to your concerns of fewer connections between the 24-inch transmission main in the Iroquois corridor we offer the following explanation. It is our understanding the purpose of this transmission main is to convey water to the southwest portion of Flint. In the Iroquois corridor alone there are 18 connections (1 about every 300 feet) feeding off the transmission main. With the aid of our water system hydraulic modeling software, we were able to reliably eliminate 4 connections. Based the modeling data, there would be little or no loss of capacity in the Iroquois corridor with the elimination of these 4 connections. There are 12-inch mains located a couple blocks east and west of Iroquois corridor, one along Chevrolet Ave to the other along Martin L. King Avenue that are able to fulfill the demands in the area even without these four connections. If you have any other questions or concerns my contact information is provided below.

Thanks,

Dean A. Oparka, P.E.

Senior Project Engineer

Rowe Professional Services Company

Mail: P.O. Box 3748

Location: 540 S. Saginaw Street

Flint, MI 48502

Office Phone: (810)-341-7500

Cell phone: (810)-701-8217

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 131020 MAR 18 2013

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1976

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 131020 MAR 13 2013

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1976



LETTER OF TRANSMITTAL

TO: Michigan Dept. of Environmental Quality
525 W. Allegan (Constitution Hall 4th Floor)
Lansing, Mi 48909-7742

Date: September 27, 2012

ROWE Job No: 09C0087

RE: Permit Application

Anticipated ☐ By 10am next business day

Delivery: ☐ By end of next business day

☒ Standard delivery

Attn: Mike Prysby, P.E.

cc:

If shipping via UPS please provide Recipient's Phone No. 577-335-6122

DEQ
RESOURCE MANAGEMENT DIVISION

OCT 10 2012

WE ARE SENDING YOU:

☒ Attached ☐ Under separate cover via _____

COPIES	DATE	NO	DESCRIPTION	LANSING DISTRICT
2	9-27-12	94	City of Flint 24"- Water Main Replacement full set of plans, sealed and signed	
2	9-27-12	21	City of Flint Water Main Specifications sealed and signed	
1	5-22-12	4	Permit Application for Water Supply Systems	

THESE ARE TRANSMITTED:

☒ For your use ☐ As requested ☐ Other: _____

REMARKS:

Mike,

Attached are the final plans for the proposed 24" main replacement in the City of Flint, for your review and approval. The City of Flint has not decided on a date to start construction, however they prefer to have an approved permit to expedite the bidding and awarding of the project when they do decide to go forward with the construction. If you have any questions just call or send an e-mail.

Thanks,

Signed: _____

Dean A. Oparka, P.E.
Senior Project Engineer

This communication contains **privileged or confidential** information intended exclusively for the use of the Person(s) or Entity named above. If the reader of this cover page is not the intended Recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please telephone (collect) the Sender immediately. Thank you very much.

Prysby, Mike (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, April 12, 2012 3:29 PM
To: Worthington, David (DEQ); 'Jeff Markstrom'
Subject: Flint DWRF - Preliminary Plans
David, Jeff

I have completed my review of the preliminary plans for the Flint DWRF project that includes the 16, 24, and 30- inch transmission mains, Torrey Road pump station improvements, and Cedar Street pump station electrical improvements. These projects are essentially a re-proposal of the projects submitted for review and approval in 2009. The majority of our comments were addressed in the 2009 proposal. The 2012 proposal has not changed much and our review did not reveal any major concerns or need for revision. There were few minor questions that I discussed with you that should be clarified and are listed below.

1. The 24-inch transmission main appears to show a parallel 24-inch main in Dupont St between Pasadena and Myrtle Ave. What is the purpose of the parallel main?
2. The final stretch of 30-inch transmission piping on Flint WTP grounds from approx. Sta 404 +50 to the pump house is not shown. We are assuming that this stretch of piping will be shown on the final plans.

If you have any questions, please don't hesitate to call or e-mail me.

Michael Prysby, P.E.
Acting District Supervisor
Resource Management Division
Department of Environmental Quality
517 335-6122

4/12/2012

Prysby, Mike (DEQ)

From: Dean Oparka [DOparka@rowepsc.com]

Sent: Monday, April 16, 2012 10:29 AM

To: Jeff Markstrom; Prysby, Mike (DEQ)

Subject: RE: Flint DWRF - Preliminary Plans

Mike,

We offer the following comments in response to your request for clarification on the items list below.

1. The 24-inch transmission main appears to show a parallel 24-inch main in Dupont St between Pasadena and Myrtle Ave. What is the purpose of the parallel main? *The parallel main is incorrectly labeled and will be changed to 8 inch on the final plans. This parallel main is being proposed to remove the 20 or so services that are currently connected to the 24 inch transmission main.*
2. The final stretch of 30-inch transmission piping on Flint WTP grounds from approx. Sta 404 +50 to the pump house is not shown. We are assuming that this stretch of piping will be shown on the final plans. According to the City of Flint Plant Supervisor, Brent Wright, the pump house is no longer necessary and therefore the portion of main was eliminated from the project. We will be meeting with Mr. Wright to further discuss the proposed improvements at the WTP prior to preparing final plans for submittal to your office.

If you have any questions regarding our comments just email me or call me on my cell at 810-701-8217 anytime.

Thanks,
Dean

From: Jeff Markstrom

Sent: Thursday, April 12, 2012 4:08 PM

To: Dean Oparka; Rick Freeman

Subject: Fwd: Flint DWRF - Preliminary Plans

Dean

Let's discuss these comments on Friday

Jeff

Begin forwarded message:

From: "Prysby, Mike (DEQ)" <PRYSBYM@michigan.gov>

Date: April 12, 2012 3:29:00 PM EDT

To: "Worthington, David (DEQ)" <WORTHINGTOND@michigan.gov>, Jeff Markstrom <JMarkstrom@rowepsc.com>

Subject: Flint DWRF - Preliminary Plans

4/16/2012

David, Jeff

I have completed my review of the preliminary plans for the Flint DWRF project that includes the 16, 24, and 30- inch transmission mains, Torrey Road pump station improvements, and Cedar Street pump station electrical improvements. These projects are essentially a re-proposal of the projects submitted for review and approval in 2009. The majority of our comments were addressed in the 2009 proposal. The 2012 proposal has not changed much and our review did not reveal any major concerns or need for revision. There were few minor questions that I discussed with you that should be clarified and are listed below.

1. The 24-inch transmission main appears to show a parallel 24-inch main in Dupont St between Pasadena and Myrtle Ave. What is the purpose of the parallel main?
2. The final stretch of 30-inch transmission piping on Flint WTP grounds from approx. Sta 404 +50 to the pump house is not shown. We are assuming that this stretch of piping will be shown on the final plans.

If you have any questions, please don't hesitate to call or e-mail me.

Michael Prysby, P.E.
Acting District Supervisor
Resource Management Division
Department of Environmental Quality
517 335-6122



Dayne Walling
Mayor

CITY OF FLINT

INFRASTRUCTURE AND DEVELOPMENT

UTILITIES DIVISION

Michael K. Brown
Financial Manager

Howard Croft
Director

June 14, 2012

Michael Prysby, P.E.
District Engineer
MDEQ Resource Mgt. Division
Lansing District Office

DEQ
RESOURCE MANAGEMENT DIVISION

JUN 18 2012

LANSING DISTRICT

Dear Mr. Prysby

RE: City of Flint Water Distribution System Operator In Charge

Pursuant to the letters you sent in August and December 2011, the City of Flint hereby notifies the DEQ that we have an assigned Operator in Charge (OIC) of our water distribution system. **That individual is Robert Bincsik. He is certified at the S-1 level. His Operator ID is 13784.** I have enclosed the Operator and Backup Operator Designation Form with the necessary information as we discussed.

Should you need additional information, please call me at (810) 766-7165, extension 2602.

Sincerely,

Daugherty 'Duffy' Johnson III
Utilities Administrator

Attachment

XC: Howard Croft, Director, Infrastructure and Development Department



Dayne Walling
Mayor

Michael K. Brown
Financial Manager

Howard Croft
Director

CITY OF FLINT
INFRASTRUCTURE AND DEVELOPMENT
UTILITIES DIVISION

May 9, 2012

Michael Prysby, P.E.
Michigan Department
of Environmental Quality
525 W. Allegan Street
P.O. Box 30242
Lansing, MI 48909-7742

DEQ
RESOURCE MANAGEMENT DIVISION

MAY 14 2012

LANSING DISTRICT

Dear Mr. Prysby:

The Karegnondi Water Authority (KWA) has the potential to be a major factor in our region's economic development efforts. The City of Flint is pleased to be a partner in the process and we pledge to offer our assets to support the development. We appreciate your technical support as we develop our components of the project.

Sincerely,

Howard Croft, Director
Infrastructure and Development

HC/DJ/dls

xc: Daughtery Johnson, Utilities Administrator





RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

May 7, 2012

Mr. Howard Kroft, City Administrator
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502-1416

WSSN: 2320

Dear Mr. Kroft:

SUBJECT: Flint Water Treatment Plant – Future Operation

This letter confirms our May 1, 2012, meeting with you, Mr. Daugherty Johnson III, Utilities Administrator, Mr. Brent Wright, Water Plant Superintendent, and other water utility operators. Mr. Patrick Cook, Treatment Specialist, from the Department of Environmental Quality (DEQ), also attended the meeting.

The purpose of the meeting was to discuss options for blending treated water from the Flint River with water purchased from the Detroit Water and Sewerage Department (DWSD) or blending Flint River water with raw water purchased from the Karegnondi Water Authority (KWA) and subsequent treatment at the Flint Water Treatment Plant (WTP).

The city of Flint may elect to utilize their WTP for the blending of treated water from the Flint River with water purchased from DWSD or KWA provided that all applicable drinking water standards are maintained. Also, the city is encouraged to produce and distribute treated water that is comparable to the aesthetic quality of water purchased from DWSD. Various treatment parameters discussed in the meeting that the Flint WTP will be required to meet are listed in the bulleted items below.

- CT (disinfectant concentration times total contact time through the treatment process) must be maintained to provide not less than 99.9% (3-log) removal of giardia and not less than 99.99% (4-log) removal viruses.
- The residual disinfectant concentration in the water entering the distribution system shall not be less than 0.2 milligrams per liter for more than 4 hours.
- Filter effluent turbidity (combined filter effluent); Not less than 95% of the measurements taken each month shall be less than or equal to 0.3 ntu. Also, at no time shall the turbidity level exceed 1 ntu.

- The fluoride concentration in Flint's finished water must remain comparable to the fluoride concentration in DWSD's water.
- Suggested Practices recommends, and we fully endorse, monitoring WTP filters and plant tap for total coliform bacteria on a daily basis. In addition to plant tap monitoring, a protocol should be established for monitoring both treated water components prior to blending.
- Finished water must meet all other applicable Maximum Contaminant Levels for organic and inorganic parameters.

Based upon the 2007 Water Treatment Plant Sanitary Survey and the results of the most recent WTP test runs, we are confident that the WTP can meet the operational parameters discussed above. Given the installation of intermediate chlorination and improved ozone residuals, Flint's CT calculation will need to be updated.

Since Flint was not required to conduct the initial round of source water monitoring for cryptosporidium, treatment classification as part of the Long Term 2 Enhanced Surface Water Treatment Rule requirements has not been determined for the WTP. The next round of cryptosporidium monitoring begins in 2015 and subsequent bin treatment classification for Flint will be determined by 2017 (after completing 24 months of monitoring). Additional treatment for cryptosporidium may be required depending on the monitoring results.

Also, since DWSD would no longer be Flint's sole source of water, various water distribution system programs including Flint's Bacteriological Monitoring, Lead and Copper, and the Stage 2 Disinfectants and Disinfection Byproducts monitoring programs will change. Specific changes to these monitoring programs will be discussed in more detail after the city identifies the future operation of the Flint WTP.

The DEQ has no objection to blending Flint River water with water purchased either from DWSD or the KWA. This type of operation will place Flint's WTP into service on a full-time basis and be of benefit in several ways. Fulltime operation will help to ensure proper function and optimization of treatment while allowing WTP operators to accrue additional experience at operating and monitoring all unit processes. Fulltime operation also helps to keep treatment equipment and their components in a reliable state of operation.

Finally, a question was raised as to the extent that the city of Flint will be required to provide a full-time back-up water supply to the city and Genesee County. As we discussed, the average day demand (with restrictions on nonessential water use) for the combined needs of Flint and Genesee County will need to be met. Both capacity and hydraulics (transmission capabilities to Genesee County) need to be determined, as part of a basis of design towards proposing a full back-up water supply for both Flint and Genesee County.

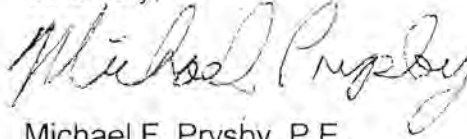
Mr. Howard Kroft

3

May 7, 2012

Should you require further information, please contact me at the telephone number below; via e-mail at prysbym@michigan.gov; or Department of Environmental Quality, P.O. Box 30242, Lansing, Michigan 48909.

Sincerely,



Michael F. Prysby, P.E.,
District Engineer
Resource Management Division
Lansing District Office
517-335-6122

mfp:jir

cc: Mr. Daugherty Johnson III, City of Flint, Utilities Administrator
Mr. Brent Wright, City of Flint, Water Treatment Plant
Mr. Lonnie Lee, DEQ
Mr. Patrick Cook, DEQ



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

December 21, 2011

Mr. Michael K. Brown, Emergency Manager
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502-1416

Dear Mr. Brown:

SUBJECT: Water Distribution System Operator Certification;
City of Flint; WSSN 02310

The purpose of this letter is to inform you of an operator certification deficiency that the City of Flint (the City) has not resolved concerning oversight of the city's water distribution system. Specifically, the Flint water distribution system must be overseen by a water distribution system Operator-in-Charge (OIC) having an S-1 drinking water certification. This deficiency began on July 31, 2011, when the city's S-1 certified OIC, Mr. Michael Brown (Utilities Administrator) retired.

The City was informed in our August 11, 2011, letter (copy enclosed) of the need to designate a new S-1 certified OIC for the water distribution system. The water distribution system OIC would be in overall charge of the water distribution system and would be responsible for making decisions regarding the daily operational activities of the water distribution system. Under standard operation, the water distribution system OIC shall be employed and available on a daily basis to oversee records maintenance and analysis, planning, monitoring, construction, and maintenance and to supervise and direct staff responsible for daily operations.

The City was offered the option to retain a temporary OIC, for short term operation, in the event that an S-1 certified OIC was not available. The temporary OIC would allow the City to remain in compliance with the S-1 certification requirement while the City either recruited a replacement or promoted an existing staff member to the OIC position. If the City was to retain a temporary OIC, we were to review a proposed scope of services prior to the City entering into a contract. If the City did not desire to promote a staff member to the position of OIC, then the City was to immediately pursue hiring a full-time OIC, such that the OIC was on staff within 6 months (February 11, 2012). To date, we have not received any communication from the City indicating that corrective action has been taken to resolve this deficiency.

Mr. Michael K. Brown

2

December 21, 2011

In accordance to Section 9 (5) of the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399) and the Administrative Rules, "A public water supply shall be under the supervision of a properly certified operator as specified in the rules."

R 325.11905 (1) of the Administrative Rules states "Any waterworks system or a portion of a system which has been classified in accordance with R 325.11901 or R 325.11902 shall be under the supervision of an operator in charge certified in the system classification as specified in these rules." In accordance with R 325.11902, the City's water distribution system has an S-1 classification.

We are requesting that the City provide us a written response to this letter by January 15, 2012, as to how the deficiency in the operator certification requirements will be corrected by the February 11, 2012, deadline. The response should include a schedule by which compliance is to be achieved. Finally, we must also affirm our position that if the City does not intend to promote an existing staff member (currently holding an S-1 certification or able to obtain an S-1 certification within the next exam cycle) to the OIC position, then the City must have a newly hired S-1 OIC on staff by no later than February 11, 2012. Failure to correct this deficiency may result in escalated enforcement action.

Should you require further information, please contact me at the telephone number below; via e-mail at prysbym@michigan.gov; or Department of Environmental Quality, P.O. Box 30242, Lansing, Michigan 48909.

Sincerely,



Michael F. Prysby, P.E.,
District Engineer
Resource Management Division
Lansing District Office
517-335-6122

mfp:jir

cc: Mr. Howard Croft, City of Flint, Director of Infrastructure
Mr. Phil Mathews, City of Flint, Water Service Center
Mr. Rick Freeman, City of Flint, Acting City Engineer
Mr. John Craig, DEQ
Mrs. Bethel Skinker, DEQ

File #
2310**Prysby, Mike (DNRE)**

From: Jill Bauer [JBauer@rowepsc.com]
Sent: Thursday, August 18, 2011 2:19 PM
To: Prysby, Mike (DNRE)
Subject: City of Flint - Stewart Ave Water Main Permit

Mike,

The City of Flint is no longer planning to replace the water main along Stewart Ave. They do not have funds available to complete the work. No permit is needed at this time.

Thank you,

Jill Bauer, P.E.
Project Engineer

✕ Description: IMAGE

540 S. Saginaw Street, Ste 200
P.O. Box 3748
Flint, MI 48502

(O) 810.341.7500 ext. 2244

(F) 810.341.7573

(C) 517.420.6746

✕ Description: RPSC tag

8/18/2011

10 AUG 08 2011

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS

(CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Natural Resources and Environment (DNRE) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint Water Service Center 3310 E. Court Street Flint, MI 48506 WSSN: 2310	Permit Stamp Area (DNRE use only)	
2. Owner's Contact Person (provide name for questions): Contact: Phil Mathews Title: Utilities Superintendent Phone: (810)-766-7202		
3. Project Name (Provide phase number if project is segmented): Stewart Avenue Rehabilitation	4. Project Location (City, Village, Township): City of Flint	5. County (location of project): Genesee

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

cc:

Issued by: _____

Reviewed by: _____

☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DNRE District Office having jurisdiction in the area of the proposed construction.

Please Note:

- a. This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- b. The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DNRE permits, or approvals from other units of government as may be required by law.
- c. This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- d. Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- e. Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- f. All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- g. All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- h. Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- i. Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions **will be returned**. SEE EXAMPLES BELOW. Use additional sheets if needed.

300 feet of 12-inch water main in Stewart Avenue from Clio Road to Wisner Street
 4800 feet of 8-inch water main in Stewart Avenue from Wisner Street to DuPont Street

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address: Jill Bauer, P.E. Rowe Professional Services Company P.O. Box 3748 Flint, MI 48502	8. Indicate who will provide project construction inspection: ☐ Organization listed in Box 1. ☒ Engineering firm listed in Box 7. ☐ Other – name, address, and phone number listed below.
9. Is a basis of design attached? ☐ YES ☒ NO If no, briefly explain why a basis of design is not needed. Replacing an existing 8-inch main	
10. Are sealed and signed engineering plans attached? ☒ YES ☐ NO If no, briefly explain why engineering plans are not needed.	
11. Are sealed and signed construction specifications attached? ☒ YES ☐ NO If specifications are not attached, they need to be on file at DNRE.	
12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed? ☒ YES ☐ NO If no, explain which deviations were made and why.	
13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved? ☒ YES ☐ NO If no, describe what coatings, additives or materials did not meet the applicable standard and why.	
14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement? (For projects not located in the public right-of-way, utility easements must be shown on the plans.) ☒ YES ☐ NO If no, explain how access will be obtained.	
15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451? ☐ YES ☒ NO If yes, a wetland permit must be obtained.	
16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules? ☐ YES ☒ NO If yes, a flood plain permit must be obtained.	
17. Is the project construction activity within 500 feet of a lake, reservoir, or stream? ☐ YES ☒ NO If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.	

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?

☐ YES ☒ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☐ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☐ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES ☒ NO

If yes, attach a copy of a plan acceptable to the DNRE for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DNRE district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) _____

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☐ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DNRE.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, Philip Matthews (name), acting as the WSC Supervisor (title/position) for

(print)

(print)

CITY OF FLINT

(print)

(entity owning proposed facilities) certify that this project has

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.

Philip Matthews

Signature*

8-5-11 810-377-3618

Date

Phone

*Original signature only, no photocopies will be accepted.



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

August 11, 2011

Mr. Gregory A. Eason, City Administrator
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502-1416

Dear Mr. Eason:

SUBJECT: Water Distribution System Operator Certification, City of Flint

It was brought to our attention that the city of Flint's water distribution system Operator-in-Charge (OIC), Mr. Michael Brown (Utilities Administrator), has retired from the city effective July 31, 2011. Mr. Brown's retirement raises the issue of operation and maintenance oversight of the Flint water distribution system by an S-1 certified operator.

By definition, the water distribution system OIC is a properly certified operator who is designated by the city as the responsible individual in overall charge of the water distribution system and who makes decisions regarding the daily operational activities of the water distribution system that will affect the quality or quantity of drinking water. Under standard operation, the water distribution system OIC shall be employed and available on a daily basis to oversee records maintenance and analysis, planning, monitoring, construction, and maintenance and to supervise/direct staff responsible for daily operations. Specifically, the city of Flint is required to have an S-1 certified operator be designated as the OIC and oversee the operation and maintenance of the water distribution system.

The city will need to designate a new water distribution system OIC with an S-1 certification. The city also needs to designate a back-up operator. Enclosed is an Operator and Back-up Operator Designation Form. Please complete the form and return it to our office.

Next, in the event that an OIC is not available to meet the standard operation criteria, it will be acceptable, for short-term operation, for the city to recruit a replacement or promote a staff member to the OIC position. During this interim period, the city must retain a temporary OIC having an S-1 certification to visit the water supply system at least twice a week, to be on-call 24 hours per day, and supervise/direct staff responsible for daily operations. The following conditions also apply:

Mrs. Gregory A. Eason

2

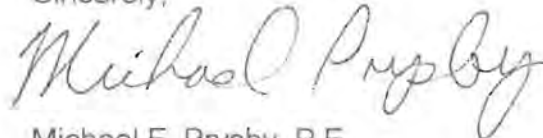
August 11, 2011

- If the city wishes to promote a staff member to be the OIC after the staff member has achieved proper certification, this individual must first qualify to write the S-1 certification examination when it is next offered (November 2011). If this individual fails the examination, the city must immediately pursue the hiring of a full-time OIC.
- If the city does not desire to promote a staff member to be the OIC, then the city must immediately pursue hiring a full-time OIC. The OIC must be on staff within 6 months.

Finally, if the city retains a temporary OIC, we would appreciate an opportunity to review the scope of services if the city enters a new contract.

Should you require further information, please contact me at the telephone number below; via e-mail at prysbym@michigan.gov; or Department of Environmental Quality, P.O. Box 30242, Lansing, Michigan 48909.

Sincerely,



Michael F. Prysby, P.E.,
District Engineer
Resource Management Division
Lansing District Office
517-335-6122

mfp:jir

cc: Mr. Phil Mathews, City of Flint, Water Service Center
Mr. Peter Bade, City of Flint
Mr. Mark Joseph, DEQ



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

June 20, 2011

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

Dear Mr. Wright:

SUBJECT: City of Flint Water System

This letter confirms my visit you and Mr. Michael Glaskow on June 9, 2011. The purpose of the visit was to conduct routine water system surveillance and to observe a routine water treatment plant (WTP) test-run. The status of various water related concerns were discussed during the visit and these are discussed in more detail below.

1. A routine WTP test-run was being conducted and, based upon the site visit, finished water turbidity and total coliform treatment objectives were being achieved. Specific operating parameters along with an overall summary of the test-run will be provided to us in the test-run report. Finally, we have not received the reports for the WTP test-runs completed since 2010. It is our understanding that three test runs were performed in 2010 and two (including the current test run) in 2011. Please provide us with a copy of these WTP test run reports. Finally, we are pleased with the commitment put forth to conduct routine WTP test-runs and we encourage the city to maintain this level of commitment.
2. WTP staff are continuing to work on the WTP Standard Operating Procedure (SOP) for routine test-runs and pipeline emergencies. Please provide us with a copy of the SOP after it is completed.

Next, WTP staff and Water Service Center (WSC) staff are working to complete the water system Emergency Response Plan (ERP). Again, please provide us with a copy of the ERP for our review and approval.

Finally, a mock Improved Explosive Device (IED) Attack on the Flint WTP was conducted on May 12, 2011. The mock exercise tested the response, coordination and communications between the City of Flint, Genesee County first responders, and state departments. The DEQ, however, was not notified of the mock incident due to a breakdown in communication during changes in

emergency oversight at the WTP. It is our understanding that WTP staff are making further changes to the water system ERP to include specific instructions confirming that all critical contacts have been notified.

3. Based upon our discussion, Phase II of the reliability study is nearly complete. We look forward to reviewing the second phase of Flint's reliability study when it becomes available. Finally, it is also our understanding that the amended Phase I report will be included with the Phase II report.
4. The 2011 Drinking Water Infrastructure Needs Survey was sent to the city in March 2011. It is our understanding that WTP and WSC staff are working to complete the survey by the end of June. We encourage the city to complete and return the survey to our office within the next several weeks.

Finally, the city of Flint continues to investigate its long-term source for drinking water. Options for future water supply source include; continued service from Detroit, establishing a new surface water source from Lake Huron – Karegnondi project (as a joint venture with other communities), or utilization of Flint's existing resources. As we discussed in our previous letter, each option will require a certain level of WTP and pumping station operation. Please keep us updated concerning the city's progress towards identifying the most practical alternative for its long-term source for drinking water. We will also continue to meet with you and your water department staff on a quarterly basis to review the issues and the efforts concerning the city's water system.

Should you require further information, please contact me at the telephone number below; via e-mail at prysbym@michigan.gov; or Department of Environmental Quality, P.O. Box 30242, Lansing, Michigan 48909.

Sincerely,



Michael F. Prysby, P.E., District Engineer
Environmental Resource Management Division
Lansing District Office
517-335-6122

mfp:jir

cc: Mr. Gregory Eason, City of Flint
Mr. Mike Brown, City of Flint



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT
LANSING



February 17, 2011

Mr. Gregory A. Eason, City Administrator
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502-1416

Dear Mr. Eason:

SUBJECT: City of Flint Water System

This letter confirms our meeting on February 10, 2011, with Mr. Mike Brown, Mr. Brent Wright, Mr. Rick Freeman from Rowe Incorporated, and yourself at the Flint Water Treatment Plant (WTP). The purpose of the meeting was to conduct routine water system surveillance. The status of various water related concerns discussed in our meeting and further actions necessary to correct them are discussed in more detail below.

- **Water system Emergency Response Plan (ERP)/WTP Standard Operating Procedure (SOP)** – A draft copy of the city's water distribution system contingency plan and the WTP SOP for routine test-runs and pipeline emergencies was provided to us. Several questions/comments were noted during our review of each plan and were discussed during the meeting. The questions/comments were noted on each document and provided to Mr. Wright. The questions/comments should be answered as part of preparing final versions of each plan.

Next, changes to the Administrative Rules of the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, now require an ERP in place of the contingency plan. The ERP provides an outline to follow in the event of a water related emergency (loss of pressure, contamination, etc.). The ERP is similar to a water system contingency plan; however, various types of programs/plans pertaining to water utility operation need to be referenced in the ERP. An electronic copy of the ERP template was sent to Mr. Wright and can be used for preparing Flint's ERP. We will review the completed ERP during our next routine surveillance visit.

Finally, we concur with the idea of dividing the WTP SOP into two separate SOPs for each mode of WTP operation. Specifically, a separate SOP will be established for routine test-run operation and emergency plant production. Please provide us with a copy of each SOP when they are completed.

- **Reliability study** – Based upon our discussion, Phase II of the reliability study is nearly complete. Phase II is to include various alternatives for recommended capital improvements. Asset management principals will also be included. We look forward

to reviewing the second phase of Flint's reliability study when it becomes available. It is also our understanding that the Phase I report was amended following our review comments. Please provide us with a copy of the amended Phase I study.

- **Booster pumping station deficiencies** – Based upon our discussion, improvements to the Torrey Road and Cedar Street pumping stations will be resubmitted as part of Flint's 2011 Drinking Water Revolving Fund (DWRF) application. A revised project plan that clearly identifies the need for the station upgrades, along with all of Flint's other 20-year water system needs, will need to be prepared. The project plan will also include some distribution system improvements. The city should also take the opportunity to utilize the reliability study for additional documentation in support of the projects that are included in the project plan. Finally, given the uncertainty of Flint's long-term pumping needs at Pump Station No. 4, no immediate improvements are planned for this facility.

While there is uncertainty over the degree of long-term use of Pump Station No. 4, this station is critical for today's water supply operations. Continued effort is needed now to ensure adequate reliability of Pump Station No. 4 and its respective storage reservoirs, especially during emergency operation.

- **WTP Test Runs** - Routine WTP test runs continue to be conducted on a quarterly basis. Each test run increases the experience and confidence of plant operators to further assure that plant production water meets all applicable drinking water standards. Based upon our discussion, treatment continues to improve with each test run. Given the importance of maintaining the familiarity with treatment plant operation, and the potential of needing to place the WTP into emergency operation to distribute treated water to the public, WTP test runs need to continue on a quarterly basis. Finally, please provide us with copies of the 2010 WTP test run reports
- **Operator Certification** – WTP operator Mr. Mike Glaskow has obtained the F-1 certification and has been designated as the Operator-In-Charge (OIC). As OIC, Mr. Glaskow will be responsible for reviewing and signing the following monthly/annual reports:
 - Monthly Operation Reports
 - Consumer Confidence Report and Certification Form
 - Lead/Copper Reporting Form
 - Annual Pumpage Report

Next, with Mr. Glaskow obtaining the F-1 certification, the city has achieved full compliance with the F-1 certification requirement. It is also our understanding that the city has discontinued their mutual aid agreement with Genesee County for operator assistance during routine test runs; however, the county is available to assist, as needed, during emergency operation. We encourage the city to maintain the availability of assistance from Genesee County during emergency operation.

- **Infrastructure Needs Survey** - The 2011 Drinking Water Infrastructure Needs Survey will be sent to Flint in March 2011. We encourage the city to complete and return the survey to our office. As always, we are available to meet with you to discuss various water related projects that could be included in the survey as part of

Mr. Gregory Eason

3

February 17, 2011

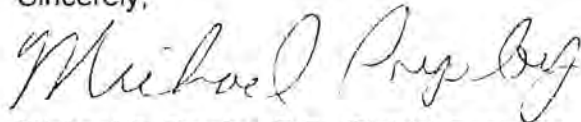
Flint's overall 20-year needs. The city should also take the opportunity to utilize the reliability study for additional documentation in support of the projects that are included in the needs survey. Finally, our department will be providing several training sessions to assist in completion of the 2011 survey. The city will be provided with additional information pertaining to the training sessions when it becomes available

- **Future Water Source** – The city of Flint is faced with the challenge of determining its long-term source for drinking water. Options for future water supply source include; continued service from Detroit, establishing a new surface water source from Lake Huron – Karegnondi project (as a joint venture with other communities), or utilization of Flint's existing resources. Each option will require a certain level of WTP operation. The level of treatment and scope of improvements at the WTP will need to be carefully evaluated as part of selecting the most suitable option. Other important factors include; short-term source(s) of supply, residuals management (correcting the violations at the Bray Road sludge lagoons vs. on-site treatment), and available source capacity (Lake Huron supply and Flint River watershed).

We appreciate having the opportunity to meet with you to discuss the status of Flint's water system and the challenges that lie ahead. Finally, we will to continue to meet with you and your water department staff on a quarterly basis to review the issues and the efforts concerning the city's water system.

Should you require further information, please contact me at the telephone number below; via e-mail at prysbym@michigan.gov; or Department of Natural Resources and Environment, P.O. Box 30242, Lansing, Michigan 48909.

Sincerely,



Michael F. Prysby, P.E., District Engineer
Environmental Resource Management Division
Lansing District Office
517-335-6122

mfp:jir

cc: Mr. Mike Brown, City of Flint
Mr. Brent Wright, Flint Water Plant
Mr. Rick Freeman, P.E., Rowe Incorporated
Mr. Brian McKenzie, Genesee County Health Department



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT
LANSING



February 17, 2011

Mr. Michael Brown, Utilities Administrator
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502-1416

Dear Mr. Brown:

SUBJECT: Customer Site Piping

The Department of Natural Resources and Environment, Environmental Resource Management Division (DNRE), has received a schematic from Alpine Engineering, Inc., detailing a proposed watermain relocation within the city of Flint. An existing 8-inch main is to be relocated to allow for construction of the proposed Department of Human Services (DHS) office building. The question was raised as to whether a construction permit would be needed to relocate the existing main.

Based upon the schematic, and that the size of the main is not being changed, a permit would not be required by our office. However, it was brought to our attention that the relocated watermain (approximately 555 feet) will be privately owned. Also based on the drawing, the private main (referred to as "customer site piping") will be connected to the city of Flint's water distribution system at both ends. Our primary concern with customer site piping with more than one connection to the municipal water system is establishment of a "flow through" situation. As water enters a private main, the utility gives up control of the water and it has the potential to re-enter the municipal system at the other connection(s). There is the potential for the degradation of water quality in a privately owned system, thus the DNRE does not allow private ownership of watermains where flow-through situations can exist. Finally, failure of the utility to acquire ownership of customer site piping where a "flow through" condition exists, is a violation of Section 325.1005a, Sec. 5a (1) of the Michigan Safe Drinking Water Act 1976 PA 399, as amended, Michigan Compiled Law 325.001 *et seq.*

The watermain proposed to serve the DHS building needs to become publically owned and maintained by the city of Flint. This will call for the establishment of a public watermain easement or right of way in this area. Any easements that are obtained need to be documented and a copy provided to us.

Mr. Michael Brown

2

February 17, 2011

Next, if the city of Flint is unable or unwilling to assume ownership of this watermain, then it will remain customer site piping. We are in the position to allow a utility to make more than one connection to customer site piping provided that double check valve assemblies are installed at each point of connection. These devices will need to be located within a concrete vault to ensure proper operation and protection. We would also suggest that a master meter be installed in the vault. Adequate valving must be installed to allow for removal of the device during maintenance.

Finally, in lieu of installing double check assemblies, the city of Flint may elect to establish an operating/maintenance agreement with the owner of the customer site piping. The contract would allow the city to have sufficient control of the main in terms of maintenance and repair without actually owning it. Enclosed is an example of an operating agreement established between the owner of customer site piping and a municipality. If the city elects to establish an operating agreement, a copy of the operating/maintenance contract needs be sent to us for review and comment.

Should you require further information, please contact me at the telephone number below; via e-mail at prysbym@michigan.gov; or Department of Natural Resources and Environment, P.O. Box 30242, Lansing, Michigan 48909.

Sincerely,



Michael F. Prysby, P.E.
District Engineer
Environmental Resource Management Division
Lansing District Office
(517) 335-6122

mfp:jir

Enclosure

cc: Ms. Shiloh Dahlin, Alpine Engineering, Inc,

F. 10# 2010



CITY OF FLINT

Dayne Walling
Mayor

Waste & Hazardous
Materials Division

FEB 23 2011

Gregory Eason
City Administrator

Lansing District

February 16, 2011

Mr. Mike F. Prysby, P.E.
Michigan Department of Environmental Quality
525 W. Allegan Street
P.O. Box 30242
Lansing, Michigan 48909-7742

Dear Mr. Prysby:

During the February 10, 2011 meeting at the Flint Water Treatment Plant, you expressed concerns about Flint's Water Treatment Plant Operator in Charge. As we discussed in the meeting, Michael Glasgow, Water Quality Supervisor, holds an MDEQ F2 and F1R certification and is designated as Flint's OIC. Michael will be responsible for reviewing and signing MDEQ documents such as, but not limited to, the MOR, Lead & Copper and Annual Reports. Included in his responsibilities will be oversight and direction of the Water Plant staff during emergency and standard test runs. Michael will serve in this capacity until Brent Wright, Water Plant Supervisor, obtains his F1 certification.

Sincerely,



Gregory Eason
City Administrator

/lr-m

cc: Brent Wright, Water Plant Supervisor; Michael Glasgow, Water Quality Supervisor

July 2011

Analysis of the Flint River as a Permanent Water Supply for the City of Flint

Prepared for:

City of Flint

1101 S. Saginaw Street
Flint, MI 48502
(810) 766-7346

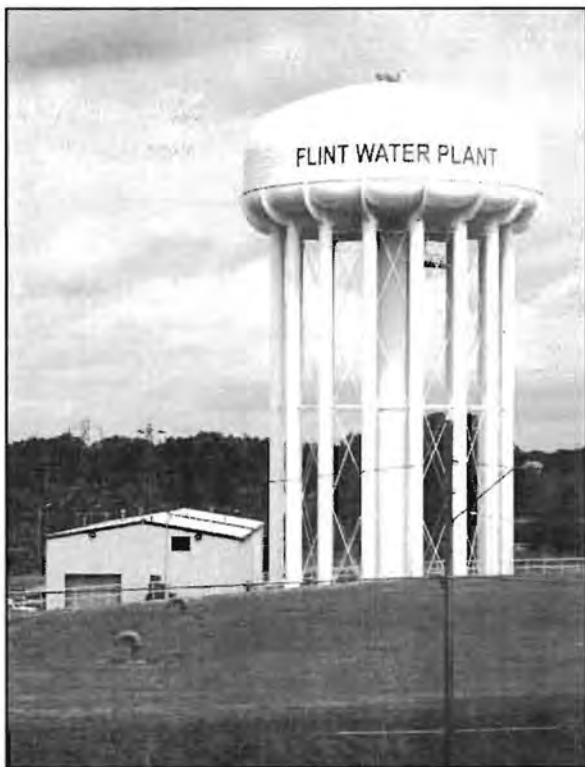


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6. 2008 Utah Dam Safety Report
7. 2008 Hamilton Dam Safety Report
8. Cost of Service Study – Flint Water Treatment Plant

I. Purpose

This study evaluates the feasibility of utilizing the City of Flint's Water Treatment Plant (WTP) and Flint River as the primary water supply for the City of Flint. The study evaluates whether the Flint River is an adequate source of water for the City of Flint and identifies upgrades needed to reliably supply water on a continuous basis.

II. History

The City of Flint's WTP was constructed in 1917 and supplied water to city customers for drinking and industrial uses. Records indicate that Flint supplied approximately 16 mgd in 1940 and that by the mid-1950s water use had increased to about 45 mgd. This significant increase coincided with increases in automobile production and population in the area. The Holloway Reservoir was constructed in 1954 to increase water supply capacity to meet the growing demand. Because of continued concerns regarding the adequacy of the Flint River for meeting the future water supply needs of the area, the city evaluated alternatives for a new water supply and ultimately contracted with the City of Detroit in 1967 for water supply. Detroit continues to supply water to Flint and its customers today. Detroit supplies finished water to the city via a single transmission pipeline. For reliability, the city's WTP has been maintained as a backup water supply in the event of a disruption to the single supply pipeline.

Because of recent concerns with the cost and reliability of the existing water supplies, the City of Flint, Genesee County, Lapeer County, the City of Lapeer, and Sanilac County are evaluating alternatives for their long-term water supply. The most recent study (Preliminary Engineering Report, Lake Huron Supply, Karegnondi Water Authority; September 2009) focused on two primary alternatives: Alternative 1 – continued supply by Detroit, and Alternative 2 – development of a new Lake Huron water supply. This study evaluates a third alternative. Alternative 3 provides for utilizing the existing City of Flint WTP to treat water from the Flint River. Alternative 3 assumes that water will be supplied only to customers within the city.

To evaluate the feasibility of Alternative 3, the river and WTP will be examined to determine their ability to supply water in sufficient quantity meeting current and anticipated regulations. There have been many new rules and regulations for treatment of surface water since 1967 when Flint's WTP was last used as a primary water supply.

III. Regulatory Requirements for Quantity of Source Water

Regulations require that the quantity of water at the source shall:

- Be adequate to meet the maximum projected water demand of the service area as shown by calculations based on a one in fifty year drought or the extreme drought of record, and should include consideration of multiple year droughts. Requirements for flows downstream of the intake shall comply with requirements of the appropriate reviewing authority.
- Provide reasonable surplus for anticipated growth.
- Be adequate to compensate for all losses such as silting, evaporation, seepage, etc.
- Be adequate to provide ample water for other legal users of the source.

IV. Demands

The alternative of utilizing the city's WTP and Flint River as a water supply will be evaluated on the basis of supplying water to Flint's direct customers only. Although Flint currently supplies water to GCDC-WWS, for this analysis it is assumed that GCDC-WWS receives its primary water supply by another source. Table 1 summarizes the city's current and projected demands for direct customers of the city. Projections have been provided by city representatives.

Table 1: City Customer Demand Summary

	2010	2035
Average Day Demand (ADD)	14.0 mgd	15.0 mgd
Maximum Day Demand (MDD)	17.5 mgd	18.0 mgd

Actual water requirements will be greater than the amount of water provided to customers. About ten percent additional water must be added for treatment processes and system operation. Water for fire-fighting is not included in customer demands and must be added to the quantity of water needed.

Surface water sources must be adequate to supply water through a drought period. Although the MDD is projected to be 18 mgd, the sustained maximum demand over a longer period will be less than the MDD. Analysis of records of water use indicates that the 30-day sustained maximum demand is about 80% of the MDD. Table 2 summarizes the source water requirements to supply the city's future needs.

*ADD for
max
MDD*

Table 2: Source Water Requirements

Future Maximum Day Demand (Customers)	18.0 mgd
Future Maximum Day Demand (WTP Backwash / Process Water)	2.0 mgd
Subtotal (Future Maximum Day Demand)	20.0 mgd
Sustained (30 day) Future Maximum Day Demand	(80% of MDD) 16.0 mgd
Replenish Water from Fire Fighting	0.7 mgd
Future Maximum Day Demand (Source Water)	16.7 mgd

V. Drought Flows

USGS records indicate that the most severe drought in Michigan occurred between 1930 and 1937, and that the low stream flows experienced during this period have a recurrence interval of 50 to 70 years. River flow records which include the drought of the 1930s will be used to evaluate the adequacy of the river as a permanent water source.

VI. Reservoir Losses

Both the Holloway Dam and Mott Dam were constructed since the drought period of the 1930s. If used to simulate the "design drought conditions", the records of flow on the Flint River from the 1930's should be adjusted for potential impact from the addition of these two dams and resulting reservoirs.

A. Evaporation

If the two reservoirs had existed during the drought period, the flows in the river would have been a little less because of the volume of water which would have been lost to evaporation from these two bodies of water.

B. Sedimentation

The July 2001 Flint River Assessment completed by the MDNR indicates that sedimentation occurs in the Holloway Reservoir at an accelerated rate, but does not provide specific volumes. Sedimentation reduces the storage volume of reservoirs. No investigation to determine the amount of sedimentation has been completed in the Holloway Reservoir since its construction, but the storage volume of the reservoir has certainly decreased since its construction.

Mott Dam maintains a fixed water level, so storage for water supply is not available. Therefore, sedimentation in Mott Lake is not a concern with respect to water supply.

C. Seepage

The land adjacent to both the Holloway Reservoir and Mott Lake has a relatively high groundwater table. Any loss of water by seepage from the bottom of the reservoirs seems likely to flow back to the river downstream of the respective dams, resulting in little or no impact to the quantity of water available for water supply or flow augmentation. Loss from the reservoirs by seepage is not considered a significant factor.

VII. Other Water Uses

Since 1967 when Detroit began supplying water to Flint, the Holloway Reservoir has been utilized as a backup water source, source of flow augmentation for the river, and for recreational purposes. Although the city maintains control over the dam and water levels; the city has leased their surrounding lands to the Genesee County Parks and Recreation Commission (GCPRC) for park, recreational, and conservation purposes. In 1987, the city and GCPRC adopted the Holloway Reservoir Management Plan (HRMP) which defined how water levels in the reservoir were to be maintained to achieve the goals above. The HRMP establishes a summer water level of 755 and a winter level of 751. Discharge from the reservoir is to be maintained above 65 cfs except when the level is less than 751; outflow from the reservoir is not to exceed inflow to the reservoir. A copy of the HRMP is included in Appendix 1.

Flow augmentation for the city's WWTP discharge is another consideration. The city's NPDES permit for their WWTP indicates that a Flint River drought flow of 85 cfs was used to determine the permitted limits for WWTP effluent. It appears that the HRMP requirement to maintain a 65 cfs minimum at the Holloway Reservoir was established to provide adequate flow in the river at the city's WWTP outfall. An excerpt of the city's WWTP NPDES permit is included Appendix 2.

The existing water supply contract between the city and Genesee County Drain Commissioner Division of Water and Waste Services (GCDC-WWS) provides that both the city and GCDC-WWS supply the other up to 8 mgd of finished water in the event of an emergency or supply disruption. For this analysis, it is assumed that the Flint WTP and river must be able to supply 8 mgd to GCDC-

WWS in the event of an emergency in addition to the quantity consumed by the city's water customers. The need to provide backup to GCDC-WWS is assumed to be limited to a period of two weeks. Over a 14 day period, 125 million gallons of water should be reserved to meet the commitment for an emergency supply.

VIII. Analysis of Adequacy of Flint River

A detailed analysis of the adequacy of the Flint River as a water supply source is included in Appendix 3. This section provides an overview.

In 1977 when the HRMP was executed, water was not withdrawn from the Flint River for water supply. In 1977 without any withdrawal for water supply, the HRMP provided for a minimum discharge of 65 cfs from the Holloway Reservoir, to provide for a river flow of 85 cfs at the city's WWTP. If water is withdrawn from the river for water supply, the minimum flow from the reservoir must be increased by the rate of WTP withdrawal if the 85 cfs base flow is to be maintained at the city's WWTP. With Flint's future sustained demand estimated to be 16.7 mgd (26 cfs), a minimum flow of 91 cfs (65 cfs + 26 cfs) will be needed from the Holloway Reservoir to maintain the 85 cfs base flow at the WWTP.

The United States Geological Survey (USGS) in a 1963 report Water Resources of the Flint Area Michigan examined the Flint River as a water supply for Flint. Using river flow records between 1930 and 1952, the USGS report includes a Draft-Storage curve for the Holloway Reservoir. If a minimum discharge of 91 cfs is to be maintained during a drought period, 6.2 billion gallons water would need to be withdrawn from the reservoir to supplement natural river flow.

In addition to the 6.2 billion gallons of storage to maintain the existing rates of flow in the river plus water supply, additional storage is required to provide GCDC-WWS an emergency supply and to make up for reservoir losses. The following table summarizes the total storage needed.

Table 3: Storage Requirements

Storage to meet sustained demand and WWTP flow	6.20 billion gallons
Storage to provide backup supply to GCDC-WWS	0.11 billion gallons
Storage to make up loss by evaporation	0.90 billion gallons
Storage lost by siltation	0.64 billion gallons (assumed)
Storage to provide loss by seepage	0.00 billion gallons
Storage Needed to Supplement River Flow	7.85 billion gallons

To provide 7.85 billion gallons of storage, the Holloway Reservoir operating level must be raised by at least three feet to 758 feet. Although possible, there are many challenges associated with operating the Holloway Reservoir at the 758 feet level.

- The existing drum gates used to control reservoir level are designed for adjustment over a four feet range (751 feet to 755 feet). The design of the dam is such that the existing gates cannot simply be replaced with larger ones to increase the upper level to 758 feet. The dam spillway will likely need to be reworked to accommodate the larger drum gates. Drawings showing the details of the dam are included in Appendix 4.

- Although operation at the 758 water level provides five feet of freeboard to the top of the dam, the watershed contributing to the reservoir is quite large and has resulted in quick increases in the reservoir level during extreme rain events. The reduction in freeboard will result in a reduced safety factor for managing flood events.
- Seepage through the earthen dam embankment will increase as a result of the increased hydraulic pressure with the higher water level. Increased seepage through the dam's embankment will reduce the strength and integrity of the embankment and is likely to increase maintenance needs.
- The 758 feet water level is based on an assumption regarding the loss of the reservoir volume by siltation. The depth of siltation should be measured to better determine the quantity of siltation and its impact on storage and reservoir level.
- Recreational activities, the fishery, and adjacent properties will be impacted by use of the reservoir for water supply. Normal water levels will be increased by three feet and during dry periods, the water levels may vary by several feet. During an extreme drought period, water levels may be as much as 11 feet below normal levels.
- If the 85 cfs drought flow at the city's WWTP cannot be achieved, a new NPDES permit with stricter discharge limits may issued by the MDEQ. This could result in higher WWTP costs for the city.

Analysis shows that without modification, the Holloway Reservoir can support a sustained maximum day demand of 11.6 mgd for water supply through a drought period.

IX. Dams

If the Flint River is to be used as water supply, existing dams will continue to be critical for management of the flows in the river and water supply. Following is a summary of the dams on and adjacent to the river.

Table 4: Summary of Dams

Facility	Construction Completed	Catchment Area (sq. mi.)	Surface Area (Acres)	Storage (Acre-Feet)	Ownership	Hazard Classification	Condition
Holloway Dam	1954	523	1,973	17,678	Flint	High	Good
Mott Dam	1972	612	684	0	GCPRC		Good
Kearsley Dam	1929	115	175	2,000	Flint	Significant	Satisfactory
Utah Dam	1928	729		0	Flint	Low	Poor
Hamilton Dam		748	17		Flint	High	Poor
Thread Creek Dam	1973	63	80	320	Flint	Significant	Poor

A. Holloway Dam

The Holloway Dam was last inspected in 2008 and was reported to be in good condition. A copy of the 2008 Dam Safety Report is included in Appendix 5. Other than routine maintenance, the following upgrades / modifications are recommended to provide a water supply of up to 11.6 mgd:

- Replacement of drum gate bearings
- Installation of river flow gage on North Branch of Flint River
- Improved instrumentation to measure and monitor gate positions and water surface level

If the river is to be used as a water supply of greater capacity than 11.6 mgd, additional modifications are required at the Holloway Dam to allow for operation at an increased water level. These improvements will include replacement of gates with larger ones and reworking of the dam spillway to accommodate the larger gates. The existing embankment should be armored to strengthen the dam's embankment and protect against erosion from wave action. A budget of \$2.57 million is established for the upgrades to the Holloway Dam to provide adequate capacity for the projected future demands.

B. Mott Dam

The Mott Dam is under the jurisdiction of the GCPRC. The reservoir level is maintained by a fixed weir so the reservoir volume is not available for storage. The dam has been reported to be in good condition.

C. Utah Dam

Utah Dam is inoperable and in poor condition. A copy of the 2008 Dam Safety Report is included in Appendix 6. Recent studies and evaluations conclude that the dam is of little benefit and should be removed. The 2010 Hamilton Dam Modifications and Riverfront Restoration PER provides a budget of \$1.9 M for removal of the Utah Dam, including replacement with a pedestrian bridge, construction of a boat launch, and local storm sewer upgrades.

D. Hamilton Dam

The Hamilton Dam is in poor condition and considered unstable. A copy of the 2008 Dam Safety Report is provided in Appendix 7. The dam has been the subject of extensive study and recommended for removal and replacement. The 2010 Hamilton Dam Modifications and Riverfront Restoration PER provides a budget of \$7.1 M for the removal and replacement of the dam, including ancillary upgrades to adjacent portions of the river.

?
The new Hamilton Dam is proposed at a lower elevation than the existing dam to reduce potential for flooding. A reduced water level upstream of the dam will reduce the water pool depth at the WTP intake, unless the Utah Dam is replaced or another dam is added. Testing of pumps at the WTP was completed to determine the impact of a reduced water depth at the WTP intake. Allowing for two feet of loss through the WTP intake screens after operation, reduction of the height of the Hamilton Dam by 1.5 feet or more will impact WTP's ability to draw water from the river.

E. Kearsley Dam

The Kearsley Dam is reported in satisfactory condition. Although the dam is located downstream of the city's WTP, water from the dam and Kearsley Lake supplements the river flow in advance of the Hamilton Dam, therefore contributing to the impoundment from which the WTP draws water. Water from the Kearsley Creek also serves to augment river flow at the city's WWTP located further downstream.

The storage volume of Kearsley Lake is relatively minor in relation to the storage deficit from Section VIII. Supplemental flows to the river from the Kearsley Creek are included in the USGS records included in this analysis

The dam is an important component of the city's water supply system because of its potential contribution to the WTP intake. Although currently in satisfactory condition, there will be ongoing maintenance needs to be addressed.

F. Thread Lake Dam

The Thread Lake Dam is reported to be in poor condition. Flow from the Thread Creek supplements the river flow prior to the city's WWTP. The storage provided by Thread Lake is negligible and flow from Thread Creek is included in the USGS records of river flow used for this analysis.

The Thread Lake Dam remains a facility of the city which because of its poor condition needs to be addressed. However, since the dam appears to be of little benefit to the water supply considered in this analysis, a budget for upgrades or removal has not been included in the costs for water supply.

X. Source Water Quality

Since the Flint WTP is the backup water supply in the event of a disruption to the supply from Detroit, raw water at the WTP intake is regularly sampled and analyzed. Available records provide a good understanding of the characteristics of the raw water and ranges of variances, and will be helpful to design water treatment processes and estimate operating costs.

Preliminary analysis indicates that water from the river can be treated to meet current regulations; however, additional treatment will be required than for Lake Huron water. This results in higher operating costs than the alternative of a new Lake Huron supply.

Although water from the river can be treated to meet regulatory requirements, aesthetics of the finished water will be different than that from Lake Huron. As an example, the temperature of water supplied to customers during the summer will be warmer than the present Lake Huron supply, because of the increased summer temperature in the relatively shallow river.

A detailed investigation of potential sources of contamination has not been completed. The MDEQ has reported that the Richfield Landfill is considering an application for an NPDES permit to allow

for discharge of stormwater and/or treated leachate to the Holloway Reservoir. If an NPDES permit is issued, there may be an impact on the quality of source water.

If used for water supply, a source water protection management plan should be developed to study the watershed, identify potential sources of contamination, and enact safeguards to prevent or control future threats.

XI. Water Treatment

For comparison with other alternatives, it is assumed that the Flint WTP will treat water from the river to provide a finished water of similar quality to the other alternatives being considered (continued Detroit supply and new Lake Huron supply).

A review of the city's WTP has been completed (Technical Memorandum, Cost of Service Study, Flint Water Treatment Plant prepared by Lockwood, Andrews, and Newnam (LAN), dated June 2011) to evaluate its ability to treat water from the river on a continuous basis to meet current and anticipated regulations and produce high quality finished water. Details regarding this review and analysis are provided in Appendix 8.

Although the WTP has been maintained and operated as a backup water supply, there have been numerous changes in regulations and standards since the WTP last supplied water on a continuous basis. Although equipment and systems at the WTP have been used sparingly, some existing equipment and systems require replacement from deterioration or obsolescence to provide reliability for continuous operation.

Following is a summary of upgrades needed.

A. Lime Sludge Disposal

Prior to supply of water by DWSD, the city's WTP disposed of lime sludge from water treatment operations at the Bray Road disposal site. The city is working with the MDEQ to address concerns at the Bray Road site; for this study it has been assumed that new sludge handling and disposal provisions will be utilized. Lime residual handling and disposal facilities have an estimated project cost of \$15.1 million. No costs have been included for remediation of the Bray Road site.

B. Soda Ash Feed System

Records of analyses of the source water indicate non-carbonate hardness. To remove the non-carbonate hardness and provide softening, soda ash should be added during treatment. The addition of a soda ash feed system has an estimated project budget of \$0.5 million.

C. Chemical Storage

Bulk chemical storage of at least 30 days is needed if the plant operates on a continuous basis. New storage tanks for liquid carbon dioxide, liquid oxygen, and liquid nitrogen will be needed. The project budget for chemical storage is \$2.1 million.

D. Electrical and SCADA

The power requirements of equipment at the WTP exceed the capacity of the substation which supplies the plant. Backup power generators at the WTP are not currently operable. Upgrades are recommended to power feeders for several of the existing systems. New SCADA is recommended to provide control and monitoring of operations at the WTP. The project budget for these upgrades is \$8.1 million.

E. Post Chlorination and Zebra Mussel Control

Zebra mussels are an invasive shell fish which have been introduced to the Great Lakes basin, including the Flint River. Zebra mussels can obstruct pipes and water intake screens. A sodium permanganate feed system is proposed for zebra mussel control. The project budget is \$0.3 million.

F. Security Issues

Additional security measures to guard against malevolent threats or terrorism which target the new water source will be required. A project budget for this is \$0.3 million.

G. Pumping System Improvements (Low and High Service Pumps in PS No. 4)

The pumps are in poor condition and their capacity is not consistent with the projected demands of the city. The pumps should be replaced with new, more efficient pumps. The project budget for these is \$7.8 million.

H. Filter Transfer Station to Dorf Reservoir and UV Inactivation

Recent USEPA regulations require additional treatment or enhancement of existing treatment processes for microbial contaminants such as giardia, cryptosporidium, viruses, and bacteria. It is anticipated that enhanced contact time and ultraviolet light deactivation will be required to comply with these new standards. A project budget of \$7.0 million is established for compliance with the new surface water treatment rules.

I. Emergency Interconnect

The GCDC-WWS and City of Flint have a mutual aid agreement providing for each to provide the other up to 8 mgd of water as a back-up supply in the event of an emergency with either system's supply. A pumping station and piping interconnect is needed to effectively complete this exchange. The project budget for these upgrades is \$8.6 million.

The total of all WTP upgrades above is \$49.9 million.

In addition to upgrades to the treatment plant, there will be increased operating costs associated with the continuous operation of the WTP. For comparison with other alternatives for a long-term water supply, only the additional operational costs have been determined.

- Labor – Full scale operation of the WTP and dams on a continuous basis will require additional staffing. It is estimated that labor costs will increase by \$2,034,000 per year.
- Chemicals – The cost of chemicals used for water treatment are estimated at \$423 per million gallons of water produced. *2.47 mil/yr*
- Residual Disposal – Disposal costs for lime sludge is estimated to be \$453,000 annually.

- Power – Increased power costs are estimated to be \$104 per million gallons of water produced.
- Ozone – Ozone treatment will be needed to meet new treatment standards. A budget of \$208,000 is assumed.
- Maintenance – Maintenance costs are assumed to be 20% of the O&M budget. Maintenance costs of the WTP and other facilities are expected to be relatively high because of the age of the facilities.

\$.6M

460,400

XII. Cost Summary

Upgrades to dams and the WTP will be needed for the Flint River to reliably supply drinking water on a continuous basis to Flint's customers. The cost of these upgrades is presented in the following table. Costs have been adjusted to an ENR Construction Cost Index of 8688 to allow for comparison with the 2009 Study. It has been assumed that design/construction commenced in 2010, to allow for comparison with the alternatives in the 2009 study.

Table 5: Project Costs

WTP Upgrades	\$49,888,000
Hamilton Dam Replacement	\$7,100,000
Holloway Dam /Reservoir Upgrades	\$2,570,000
Utah Dam Removal	\$1,900,000
Total Capital Cost	\$61,458,000

Costs shown are based on upgrades to existing facilities to supply the projected future maximum day demand of 18.0 mgd. These upgrades are based on the assumption that the HRMP is modified to allow for operation over a greater range of water levels. Other options for supplying the projected maximum day demand will result in higher costs.

Operating costs in the initial year of operation are estimated to increase \$7 million above current operating costs. Operating costs are projected to increase annually because of inflation and projected growth in demand over the study period.

Figure 1 shows the cost of water for Alternative 3, utilizing the existing WTP and Flint River for water supply. The cost of water is comprised of three components: continued purchase of water from Detroit during construction, debt for construction of facility upgrades, and ongoing operating costs.

Total d/m cost

2-034

+ 2-47

+ 0-453

0-50

0-208

0-40

5-75

Figure 1: Cost of Water Using Flint River as Source

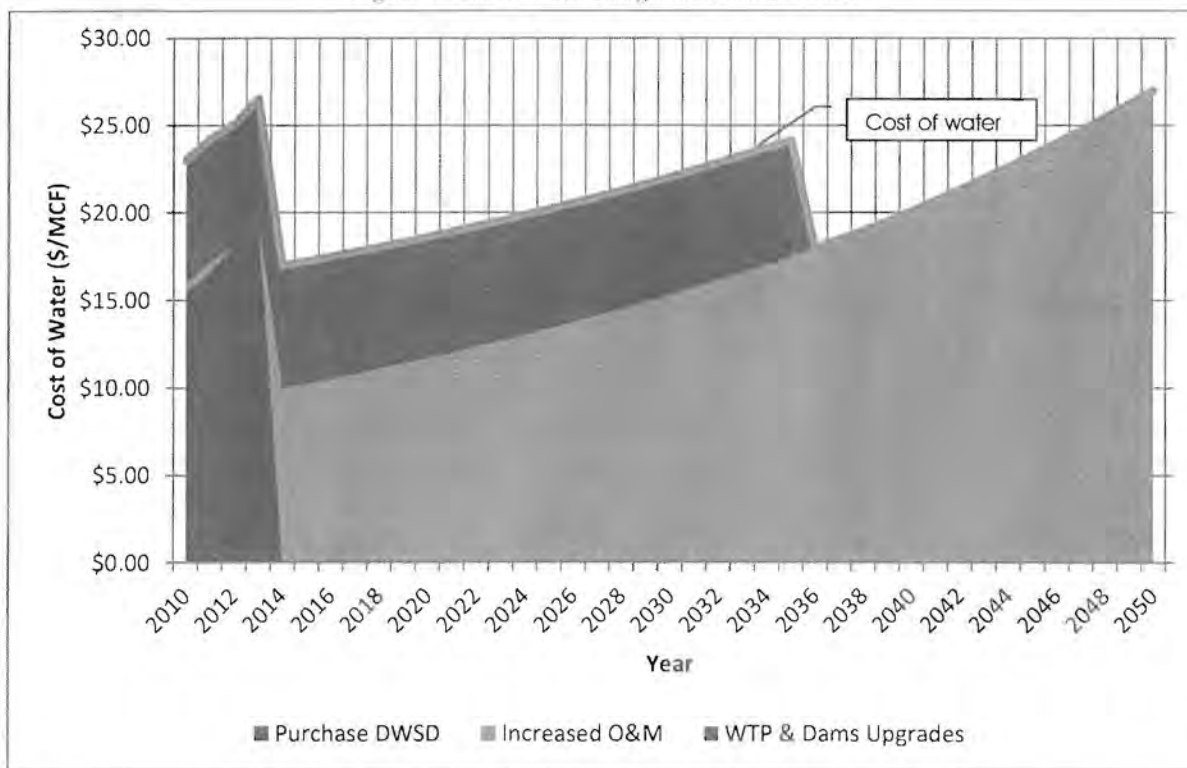
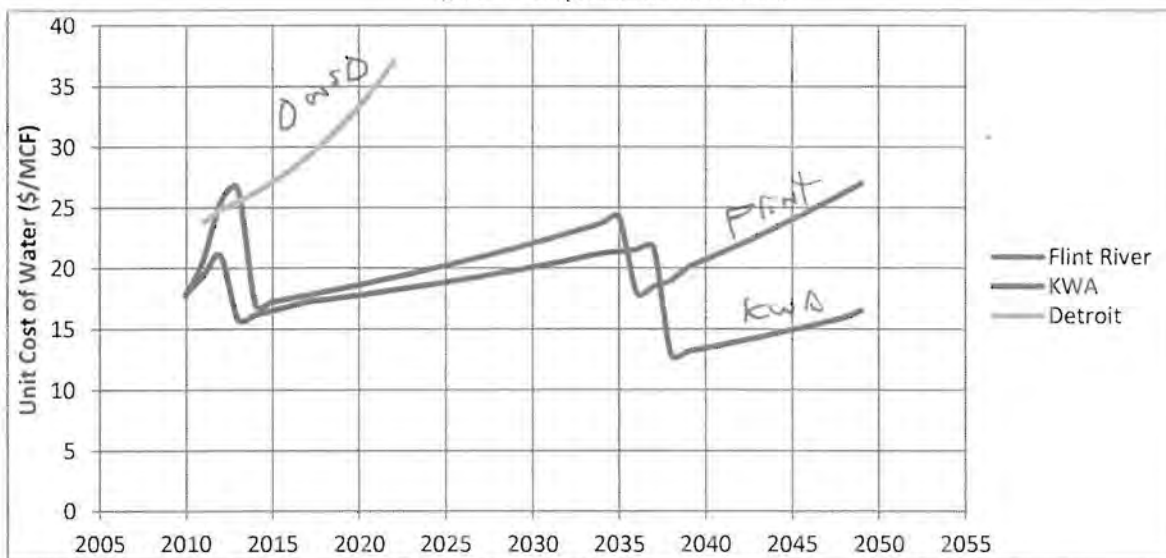


Figure 2 compares the cost of water for all three alternatives. Continued Supply by the City of Detroit results in a higher cost for water supply than the other two alternatives. The city's costs for The KWA-New Lake Huron Supply have been based upon the terms of the current KWA Raw Water Supply Contract, and the assumption that the city purchases 18 mgd capacity in the KWA system. The KWA alternative is projected to result in the lowest cost for water.

Figure 2: Comparison of Alternatives



XIII. Implementation

Planning, design, construction, and start-up will require 52 to 60 months for completion. Additional time may be required to address ancillary issues such as modifications to agreements, permits, and “non-construction related” environmental issues.

XIV. Intangibles

In addition to the upgrades identified for the dams and WTP, other issues will potentially need to be addressed if the Flint River is to be used as a water supply. Examples of these include:

- Environmental impact of work on dams or removal of sediment from the river or reservoirs
- Impact of construction and reservoir operation on the fishery
- Impact to recreational users and land owners adjacent to the Holloway Reservoir
- Potential upgrades to the city’s WWTP if river flows are reduced and stricter effluent limits are included in future NPDES permits
- Impacts of the replacement of the Hamilton Dam at a lower level for improved flood control may impact the ability for the WTP to draw water from the river
- Results of a Source Water Protection Plan which may identify potential threats of contamination or other impacts to the water supply

XV. Summary

Analysis indicates that the cost of supplying water from the Flint River on a continuous basis will be greater than the proposed KWA Raw Water Supply Contract, but less than continued supplied from Detroit. Additionally, if the Flint River is to be used for a water supply for city customers, there will need to be some modifications to existing facilities, operating agreements, and permits. Upgrades will be required at the city’s dams and the water treatment plant to reliably supply water to the city on a continuous basis. To meet the future maximum day demand of 18 mgd projected by city staff, one or more of the following will be required.

- Modify the Holloway Dam and Reservoir to provide additional storage
- Modify the HRMP to provide for more variance in water levels and/or modify limits on minimum discharge
- Modify the WWTP NPDES permit based on reduced flows in the river and provide resulting upgrades to WWTP for higher treatment
- Provide other raw water storage reservoirs

Addressing the preceding items is likely to require a great deal of time and effort because of the impacts on many other parties. Without making the modifications above, the river is limited to supplying a maximum day demand of about 11.6 mgd.

Appendices

1. Holloway Reservoir Management Plan
2. Excerpt of Flint WWTP NPDES permit
3. Analysis of Adequacy of Flint River as a Water Supply
4. Holloway Dam Drawings
5. 2008 Holloway Dam Safety Report
6. 2008 Utah Dam Safety Report
7. 2008 Hamilton Dam Safety Report
8. Cost of Service Study – Flint Water Treatment Plant

Appendix 1 - Holloway Reservoir Management Plan



March 13, 1987

TO: Members of the Ad Hoc Committee to Work With
City of Flint Officials on Management of the
Holloway Reservoir

FROM: Kenneth J. Smithee, Director
Genesee County Parks & Recreation Commission

CITIZEN REPRESENTATIVES: SUBJECT: Action of the Parks & Recreation Commission

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PRESIDENT

ARCHIE HALFORD, JR.
VICE PRESIDENT

CHARLES E. OLIVER, JR.
SECRETARY

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GENESEE COUNTY BOARD
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BOARD OF ROAD
COMMISSIONERS

ANTHONY RAGNONE
GENESEE COUNTY
DRAIN COMMISSIONER

KENNETH J. SMITHEE
DIRECTOR

Please be advised that the recommendations as outlined on Attachment A were approved by the Genesee County Parks & Recreation Commission meeting in formal session on March 12, 1987.

On behalf of the Commission, I would like to extend our personal thanks to each of you for the assistance which you rendered which led to the agreement between the Parks & Recreation Commission and the City of Flint and will provide protection for recreational users of the Holloway Reservoir, adjacent property owners and also help protect the fish and other aquatic life.

Thanks again.

Sincerely,

Kenneth J. Smithee
Director

KJS:jp
Attachment

G-5055 BRANCH ROAD

FLINT, MICHIGAN 48506

PHONE (313) 736-7100

MICHIGAN RECREATION AND PARK ASSOCIATION

AFFILIATED WITH

NATIONAL RECREATION AND PARK ASSOCIATION

R-22
AGENDA ITEM: (5). i.

PRESENTED: 3/9/87

ADOPTED: 3/9/87

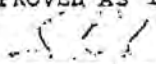
By the Mayor:

WHEREAS, the City of Flint in adopting ordinance 2208 granted to the Genesee County Parks and Recreation Commission the right to establish and operate park and recreational facilities and conservations programs on property owned by the City of Flint in the Holloway Reservoir area; reserving unto itself the power to control and regulate the dams and water levels of the Holloway Reservoir, and

WHEREAS, it is in the interests of the City and the Genesee County Parks and Recreation Commission to establish a Management Plan which optimizes the summer recreational programs available to the public while preserving downstream usages of the Flint River, and which will assist the City in implementing the provisions of ordinance 2208.

NOW, THEREFORE, BE IT RESOLVED, that the City of Flint adopts the attached Holloway Reservoir Management Plan.

APPROVED AS TO FORM:



Chief Legal Officer

R990

COUNCIL MARCH 9, 1987

HOLLOWAY RESERVOIR MANAGEMENT PLAN

GENERAL OBJECTIVE:

To operate Holloway Dam in a manner that optimizes summer recreation on the Holloway Reservoir while preserving downstream usages of the waters of the Flint River and assuring availability of a back-up water supply for Flint.

GENERAL OPERATING PROCEDURE:

Spring Fill - The City of Flint shall operate the dam with the intention of capturing a sufficient quantity of spring run-off to maintain the reservoir at a minimum elevation of 755 feet no later than May 1 of each year.

Summer Operation - The City of Flint shall maintain a minimum outflow of 65 cfs until the level of the reservoir falls to an elevation of 752.7 feet.

At any time that the level reaches elevation 752.7 feet the city shall operate the dam such that the outflow does not exceed inflow, on any given day, provided, however, that the city shall not be obligated to make more than one adjustment to flow during any given day.

Winter Drawdown - The City of Flint shall operate the dam to gradually drawdown the reservoir during the first two weeks of November to an elevation of 751 feet in order to prevent structural damage to the dam from freezing.

Notification - The City of Flint shall provide prior notification to the Genesee County Parks and Recreation Commission before making a change in dam operations which result in significant drawdown.

Maintenance and Construction - Routine maintenance shall be scheduled to avoid conflicts with major events and peak usage periods on the reservoir. A minimum of 30 days notification shall precede all maintenance and construction involving significant drawdown. The Genesee County Parks and Recreation Commission shall promptly receive copies of all dam maintenance permit applications made by the City of Flint to the Michigan Department of Natural Resources.

Gauging of Water Flow into Reservoir - The City of Flint shall be a cooperator with the U.S.G.S. and State of Michigan to establish a stream gauge on the north branch of the Flint River upstream of the Holloway Reservoir and be a cooperator on the annual maintenance and operation of the existing gauge on the south branch of the Flint River and the new gauge on the north branch of the Flint River.

EMERGENCIES:

In emergency situations affecting public health, safety and welfare the City of Flint shall operate the Holloway dam in a manner to protect the public health, safety and welfare. This shall be done even though recreational users and others may be temporarily inconvenienced. Situations which shall be identified as emergencies shall include but not be limited to the following: flood conditions, interruption of the City of Flint's public water supply, and event(s) which threatens the structural integrity of the dam, and acts of God. However, low flow augmentation for sewage treatment shall not be considered as an emergency.

MONITORING:

The City of Flint in cooperation with the Genesee County Parks and Recreation Commission will assure conformance with the Holloway Reservoir Management Guidelines. A standing oversight committee shall be created to provide monitoring of the reservoir management and facilitate exchange of timely information regarding the Holloway dam and reservoir. The committee shall be composed of two members from both the City of Flint and the Genesee County Parks and Recreation Commission and shall meet in April and November of each year. The Genesee County Parks and Recreation Commission shall provide the City of Flint with a schedule for summer events on Holloway Reservoir at the April meeting of the Oversight Committee.

PERIOD AND EXECUTION OF AGREEMENT:

The Holloway Reservoir Management Plan shall be in full force and effect when officially adopted by the Flint City Council and the Genesee County Parks and Recreation Commission and shall remain so until altered by mutual agreement.

MANAGEMENT PLAN STATUS:

This management plan establishes targets for optimal operation of the Holloway Dam and Reservoir but does not replace the terms and conditions of Flint City Ordinance No. 2208.

p:DAM(a)

Appendix 2 - Excerpt of Flint WWTP NPDES permit

PART I

Section A. Limitations and Monitoring Requirements

1. Final Effluent Limitations, Monitoring Point 001A

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge treated municipal wastewater from Monitoring Point 001A through Outfall 001. Outfall 001 discharges to the Flint River. Such discharge shall be limited and monitored by the permittee as specified below.

Parameter	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration				Frequency of Analysis	Sample Type
	Monthly	7-Day	Daily	Units	Monthly	7-Day	Daily	Units		
Flow	(report)	—	(report)	MGD	—	—	—	—	Daily	Report Total Daily Flow
Carbonaceous Biochemical Oxygen Demand (CBOD ₅)										
4/1-4/30	6,672	10,000	—	lbs/day	16	—	24	mg/l	Daily	24-Hr Composite
5/1-10/31	2,920	3,750	—	lbs/day	7	—	9	mg/l	Daily	24-Hr Composite
11/1-11/30	4,590	6,672	—	lbs/day	11	—	16	mg/l	Daily	24-Hr Composite
12/1-3/31	5,420	8,340	—	lbs/day	13	—	20	mg/l	Daily	24-Hr Composite
Total Suspended Solids										
5/1-10/31	8,340	12,500	—	lbs/day	20	30	—	mg/l	Daily	24-Hr Composite
11/1-4/30	12,500	18,800	—	lbs/day	30	45	—	mg/l	Daily	24-Hr Composite
Ammonia Nitrogen (as N)										
4/1-4/30	2,920	4,170	—	lbs/day	7.0	—	10.0	mg/l	Daily	24-Hr Composite
5/1-10/31	667	1,460	—	lbs/day	1.6	—	3.5	mg/l	Daily	24-Hr Composite
11/1-11/30	2,080	2,920	—	lbs/day	5.0	—	7.0	mg/l	Daily	24-Hr Composite
12/1-3/31	2,500	3,128	—	lbs/day	6.0	—	7.5	mg/l	Daily	24-Hr Composite
Total Phosphorus (as P)	417	—	—	lbs/day	1.0	—	—	mg/l	Daily	24-Hr Composite
Fecal Coliform Bacteria	—	—	—	—	200	400	—	cts/100 ml	Daily	Grab
Total Residual Chlorine	—	—	—	—	—	—	0.038	mg/l	Daily	Grab
Total Mercury										
Through 12/31/2008	—	—	—	lbs/day	(report)	—	—	ng/l	Quarterly	Grab
Beginning 1/1/2009	0.0042	—	—	lbs/day	10	—	—	ng/l	Quarterly	Grab
Acute Toxicity										
Through 12/31/2008	—	—	—	—	—	—	(report)	TU _A	Quarterly	24-Hr Composite
Beginning 1/1/2009	—	—	—	—	—	—	1.0	TU _A	Quarterly	24-Hr Composite
Chronic Toxicity										
Through 12/31/2008	—	—	—	—	(report)	—	—	TU _C	Quarterly	24-Hr Composite
Beginning 1/1/2009	—	—	—	—	1.5	—	—	TU _C	Quarterly	24-Hr Composite
					Minimum Daily		Maximum Daily			
pH	—	—	—	—	6.5	—	9.0	S.U.	Daily	Grab

The following design flow was used in determining the above limitations, but is not to be considered a limitation or actual capacity: A rated design capacity of 50 MGD and the 1988 Water Resources Commission directive to use a 95 percent exceedance (Flint River drought) flow of 85 cfs (Holloway Reservoir Management Plan) for limit calculations.

Appendix 3 - Analysis of Adequacy of Flint River as a Water Supply

Technical Memorandum Analysis of Adequacy of Flint River as Water Supply

1.0 Quantity of Water Required

Recommended Standards for Water Works, 2003 Edition indicates that the quantity of surface water at the source shall:

- Be adequate to meet the maximum projected water demand of the service area as shown by calculations based on a one in fifty year drought or the extreme drought of record, and should include consideration of multiple year droughts. Requirements for flows downstream of the intake shall comply with requirements of the appropriate reviewing authority.
- Provide reasonable surplus for anticipated growth
- Be adequate to compensate for all losses such as silting, evaporation, seepage, etc.
- Be adequate to provide ample water for other legal users of the source.

2.0 Demand Summary

City staff has indicated the future maximum day demand of the city is 18 mgd.

In addition to the water used by customers, some water will be required for water treatment processes and filter backwash. An allowance for WTP Backwash and Process water of 2 mgd is assumed.

Water used for fire-fighting is not included in customer demand or sales. An allowance 0.7mgd for replenishing water used for fire-fighting is assumed.

The maximum day demand represents the quantity of water which must be supplied on the particular day that the highest use (demand) occurs. Treatment and pumping must be designed to deliver the maximum day demand. During peak periods, storage from the Holloway Reservoir can be utilized to supplement the natural river flow. For analysis of the river as a source, the maximum month will be used as the demand.

A review of the city's water demands and precipitation records suggest that maximum month demand is about 80% of the maximum day demand.

The maximum sustained demand to be withdrawn from the river is computed in the following table:

Table 1: City of Flint Design Demand Summary

Future Maximum Day Demand (Customers)		18.0 mgd
Future Maximum Day Demand (WTP Backwash / Process Water)		2.0 mgd
Subtotal (Future Maximum Day Demand)		20.0 mgd
Sustained (30 day) Future Maximum Day Demand	(80% of MDD)	16.0 mgd
Replenish Water from Fire Fighting		0.7 mgd
Future Maximum Day Demand (Source Water)		16.7 mgd

3.0 Additional Demands and Requirements

In addition to the demands from Section 2, the following demands must be accounted for:

3.1 Mutual Aid

The City and GCD-C-WWS have a mutual aid agreement to supply each other water in the event of a disruption in supply or other emergency. The agreement provides that the city will supply GCD-C-WWS up to 8 mgd.

For this analysis, it is assumed that an emergency will be corrected within 14 days. The volume of water that may be required is therefore: $14 \text{ days} * 8,000,000 \text{ gal/day} = 112,000,000 \text{ gal}$. This volume will be reserved from the reservoir volume.

3.2 Evaporation

Both the Holloway and Mott dams have been constructed since the drought period of the 1930's, which is being used as the base river flow for analysis. Evaporation from the Holloway Reservoir and Mott Lake will reduce the amount of available from the river. The NWS publishes an atlas which shows evaporation rates. Evaporation is primarily a factor during the "growing season"; the atlas shows that about 24" of water is lost via evaporation from open water surfaces in Genesee County over the May through October period. Loss by evaporation will be offset by the addition of rainfall directly upon the water surface. Since the analysis is based upon drought conditions, the low rainfall having a recurrence rate of 100 years will be used. During the May through October period, 11.5 inches of rain is estimated during the 1 in 100 dry year. The net loss by evaporation is therefore 12.5 inches.

The following table summarizes the loss by evaporation, over the six month period from May through October.



Table 2: Reservoir Evaporation Loss

Reservoir	Surface Area (Acres)	Evaporation (inches)	Precipitation (inches)	Net Loss by Evaporation (Gallons)
Holloway Reservoir	1,973	24	11.5	669,646,065
Mott Lake	684	24	11.5	232,153,020
Total				901,799,085

3.3 Siltation

The July 2001 Flint River Assessment completed by the MDNR indicates that sedimentation occurs in the Holloway Reservoir at an accelerated rate, but does not provide quantities. Measurements of the silt accumulation in the reservoir have not been completed. Accumulations of several feet have occurred in other reservoirs. Sedimentation of an average of 1 foot across the Holloway Reservoir will result in the loss of 643,000,000 gallons of storage, or about ten percent of the total volume available.

Mott Lake is not used as a water storage reservoir. Its level is controlled by a fixed weir. Although siltation likely occurs in Mott Lake too, it has no impact on storage for water supply.

3.4 Seepage

Seepage is not believed to have a significant impact on the availability of water at the WTP. Seepage through the embankments of either the Holloway or Mott dams or through the bottom of the reservoirs seems likely to migrate back to the Flint River, although perhaps downstream of the reservoirs, prior to the WTP.

3.5 Flint WWTP

The City's WWTP discharges treated wastewater to the Flint River. The NPDES permit issued to the WWTP has established limits for the treated effluent, based on a drought flow in the river of at least 85 cfs.

3.6 Holloway Reservoir Management Plan

In 1977 the City and Genesee County executed the Holloway Reservoir Management Plan (HRMP) which established parameters for the operation of the dam and reservoir. In 1977, water was no longer withdrawn from the river for water supply and the HRMP appears to have been developed to address four primary issues:

- Availability to utilize the reservoir for water supply as a backup or alternative supply
- Provide for physical maintenance of the dam
- Provide for the recreational use of the reservoir
- Provide flow augmentation to Flint WWTP



The HRMP establishes a summer operating level of 755 and a winter level 751. The summer level maximizes the volume of water available during the dry period in the event that the river is to be used as a water supply. The higher level also supports recreational activities on the reservoir. The 751 winter level provides protection against damage from freezing during the winter. The HRMP establishes a minimum discharge of 65 cfs from the dam, presumably to provide a minimum flow of 85 cfs in the river at the WWTP.

4.0 Analysis

It is assumed that the demands and other requirements identified above are to be maintained in the event that water is withdrawn from the Flint River for water supply. In 1963, USGS published Water Resources Flint Area Michigan, which includes an analysis of the river as a water supply. This publication includes design information regarding the Holloway Reservoir and its operation for water supply.

In 1977 when the HRMP was executed, water was not withdrawn from the river for water supply. If the HRMP required a minimum discharge of 65 cfs at the Holloway Dam to provide for adequate flow in the river at the WWTP, the minimum discharge from the Holloway Dam should be increased by the amount of water withdrawn for water supply if the current river flow at the WWTP is to be maintained.

$$65 \text{ cfs} + 16.7 \text{ mgd (25.8 cfs)} = 90.8 \text{ cfs (58.7 mgd)}$$

Figure 1 shows the sustained discharge which can be maintained from the Holloway Reservoir during a drought period. This graph is based on USGS records of flow in the river between 1930 and 1952. This period includes the drought period of 1930 to 1937, which is USGS considers the most severe drought in Michigan history, having a recurrence period of 1 every 50 to 70 years. This period was prior to the construction of Holloway Dam, so river records reflect the natural flow of the river without impact by dam operations.



Figure 1: Draft-Storage Curve, Flint River near Otisville (excerpt from USGS Water Resources Flint Area Michigan)

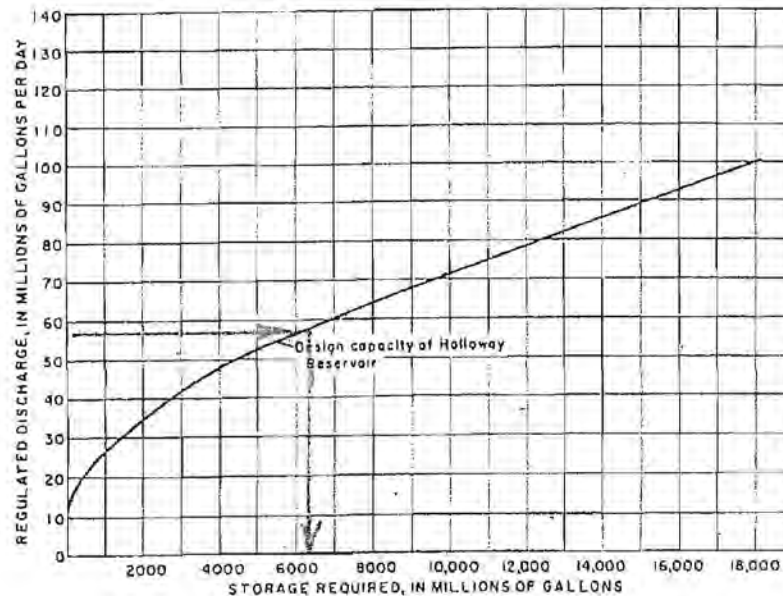


Figure 1 indicates that about 6.2 billion gallons of storage is needed to maintain a sustained discharge of 58.6 mgd from the reservoir to provide the minimum river flow of 85 cfs at the WWTP.

In addition to the 6.2 billion gallons of storage, additional storage is required to provide GCDC-WWS an emergency supply and to make up for reservoir loss by evaporation.

Table 3: Storage Requirements to Maintain Current Conditions plus Water Supply

Storage to meet sustained demand and WWTP flow:	6.20 billion gallons
Storage to provide backup supply to GCDC-WWS:	0.11 billion gallons
Storage to make up loss by evaporation:	0.90 billion gallons
Storage lost by siltation:	0.64 billion gallons (assumed)
Storage to provide loss by seepage:	0.00 billion gallons (assumed)
Storage Needed to Supplement River Flow:	7.85 billion gallons

For this analysis, it is assumed that storage is available from the Holloway Reservoir to supplement the natural river flow.

- The Holloway Reservoir was designed to provide storage for water supply in the 1950's
- The Mott Dam is a fixed weir, so storage is not available. The dam is owned by the Genesee county Parks Department and provides recreational benefit.
- The Hamilton Dam impoundment is limited to the river channel; storage volume is negligible.
- The Utah Dam is inoperable.



- The Kearsley Dam is not directly located on the Flint River, but on the Kearsley Creek just prior to its confluence with the Flint River. The Kearsley Creek discharges to the Flint River downstream of the City's WTP so storage from the river is not available for water supply; however, discharge from the Kearsley dam can be used to supplement downstream river flows, including the flow in the river at the WWTP. The Kearsley Reservoir can provide a maximum of 650 million gallons of storage.
- The Thread Lake Dam is not located on the Flint River, but the Thread Creek discharges into the Swartz Creek which discharges into the Flint River just west of the downtown area. The Thread Lake dam provides a maximum storage volume of 100 million gallons of storage. Discharge from the Thread Lake dam could be used to supplement downstream river flows, but not for water supply.
- For this analysis, storage from neither the Kearsley Reservoir nor Thread Lake is included. Both dams were constructed prior the Holloway Reservoir and discharges from the Kearsley Dam and Thread Lake Dam are assumed to be included in the analysis presented in the USGS publication.

Following is a capacity curve for the Holloway Reservoir, from the USGS Water Resources Flint Area.

Figure 2: Holloway Reservoir Storage Capacity (excerpt from USGS Water Resources Flint Area Michigan)

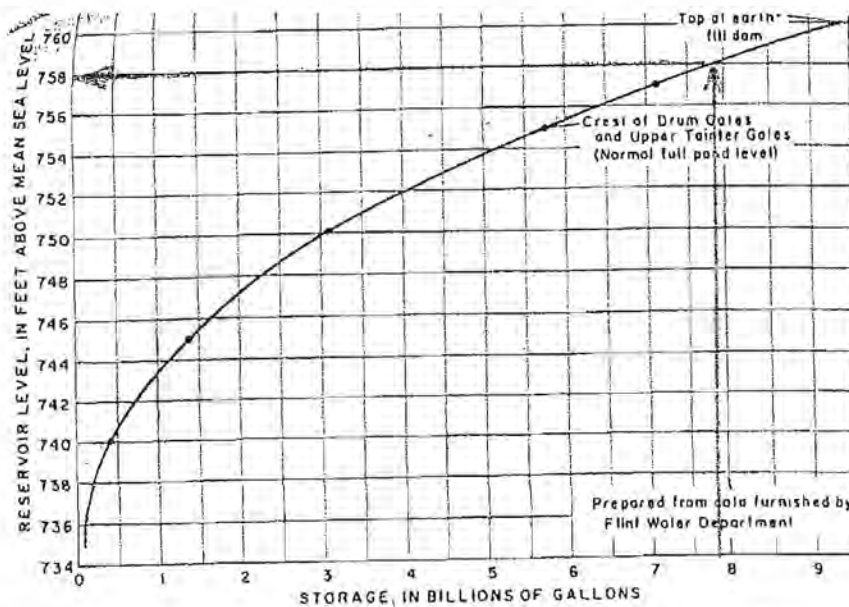


Figure 2 indicates that a Holloway Reservoir level of 758.0 feet provides storage of 7.85 billion gallons.

Review of design drawings of the Holloway Dam indicates that the dam was designed to use drum gates to maintain the normal water level(s) of the reservoir. The drum gates can rotate to allow for reservoir levels ranging from a low level of 751 feet to a high level of 755 feet. If the reservoir is to be maintained

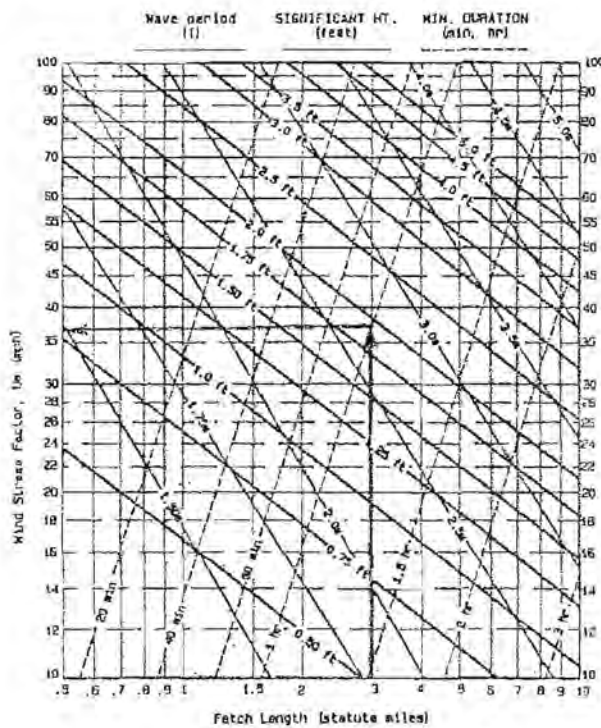
at a higher level than the current summer level of 755 feet, modifications will be required to the drum gates.

According to the original dam design drawings, the dam embankment was constructed to elevation 763 feet (however, the USGS reports shows the top elevation as 760 feet). If the reservoir level is raised to 758 feet, only about five feet of freeboard will be provided to guard against overtopping. There are three concerns regarding increasing the reservoir level from 755 to 758 feet.

The increased hydraulic pressure resulting from the higher water level on one side of the dam will result in increased seepage through the embankment, and a reduction in its integrity.

The reservoir has a fetch of about three miles east from the dam. Figure 3 shows that a 37 mph wind sustained for one hour duration from the east can result in waves capable of two feet. The original design drawings show rip-rap armoring on the reservoir side of the dam embankment to an elevation of 757 feet. Rip-rap armoring should be extended to at least two feet higher than the 758 feet level to protect against wave action.

Figure 3: Predicted Wave Action – Holloway Reservoir



The reservoir is tributary to a large watershed. There have been rapid increases in river flow (and reservoir level) soon after intense rain events in the watershed. A rain storm in June 1996 resulted in a 1.62 foot increase in the water level of the reservoir resulting in the opening of dam gates and discharge of 7,740 cfs. Reducing the freeboard also reduces the volume available for flood management.



5.0 Quantity of Water Supply Available

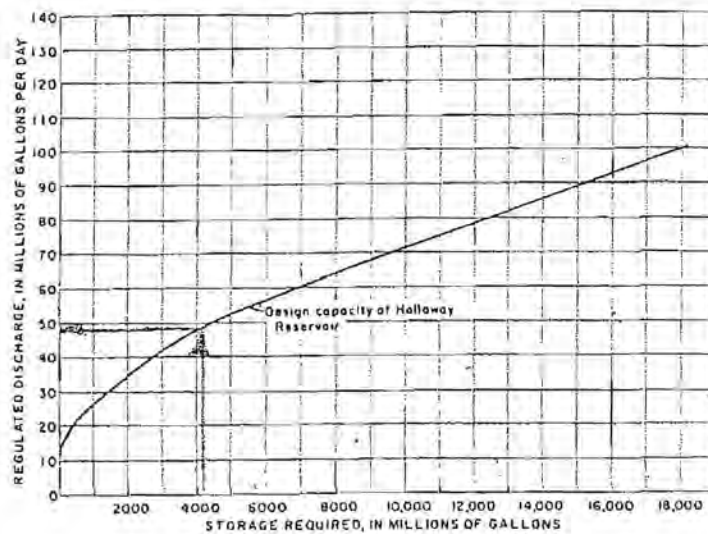
Analysis has shown that without modifications to facilities and/or permits and agreements, the river cannot supply the future maximum demand of the city.

Table 4: Storage Available for Water Supply

Original Storage Volume of Holloway Reservoir (elevation 755')	5.76 billion gallons
Storage lost by Sedimentation (assumed)	0.64 billion gallons
Storage to make up for Evaporation	0.9 billion gallons
Storage to provide backup supply for GCDC-WWS	0.11 billion gallons
Storage available to supplement river flow	4.11 billion gallons

The following figure shows that 4.11 billion gallons of storage can sustain a supplemental flow of 48 mgd.

Figure 4 – Sustained Discharge Available from Holloway Reservoir



A minimum discharge of 48 cfs from the Holloway Reservoir can support a sustained water withdrawal of about 11 mgd and maintain 85 cfs at the WWTP, as shown in the following table.

Table 5 – Maximum Sustained WTP Withdrawal Available

	1978 - Holloway Reservoir Management Plan	Future
Minimum Reservoir Discharge	65 cfs	48 cfs
River Inflow	20 cfs	20 cfs
WTP Withdrawal	0 cfs	17 cfs (10.99 Mgd)
River Flow at WWTP	85 cfs	85 cfs

A sustained water withdrawal of 11 mgd will support a maximum day demand of 11.6 mgd, as shown in the following table.

Table 6 – Available WTP Maximum Day Demand

Sustained Withdrawal Available		11.0 mgd
Water to replenish fire fighting		0.7 mgd
Sustained (30 day) Future Maximum Day Demand Available		10.3 mgd
Future Maximum Day Demand Available	(Multiply by 125%)	12.9 mgd
Water available for WTP Backwash/Process		1.3 mgd
Water available for customer Max Day Demand		11.6 mgd



Appendix 4 - Holloway Dam Drawings

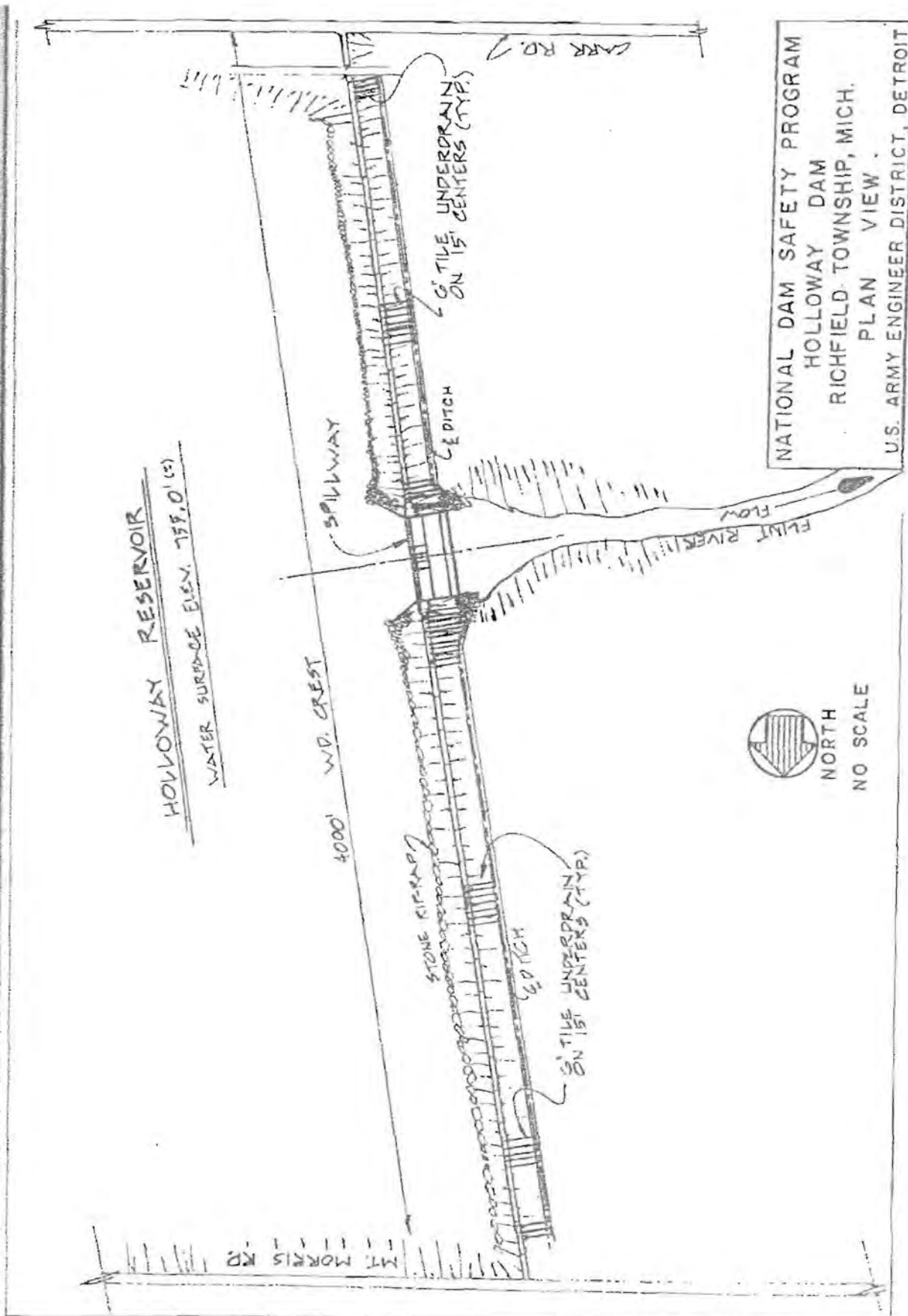


FIGURE No. 5

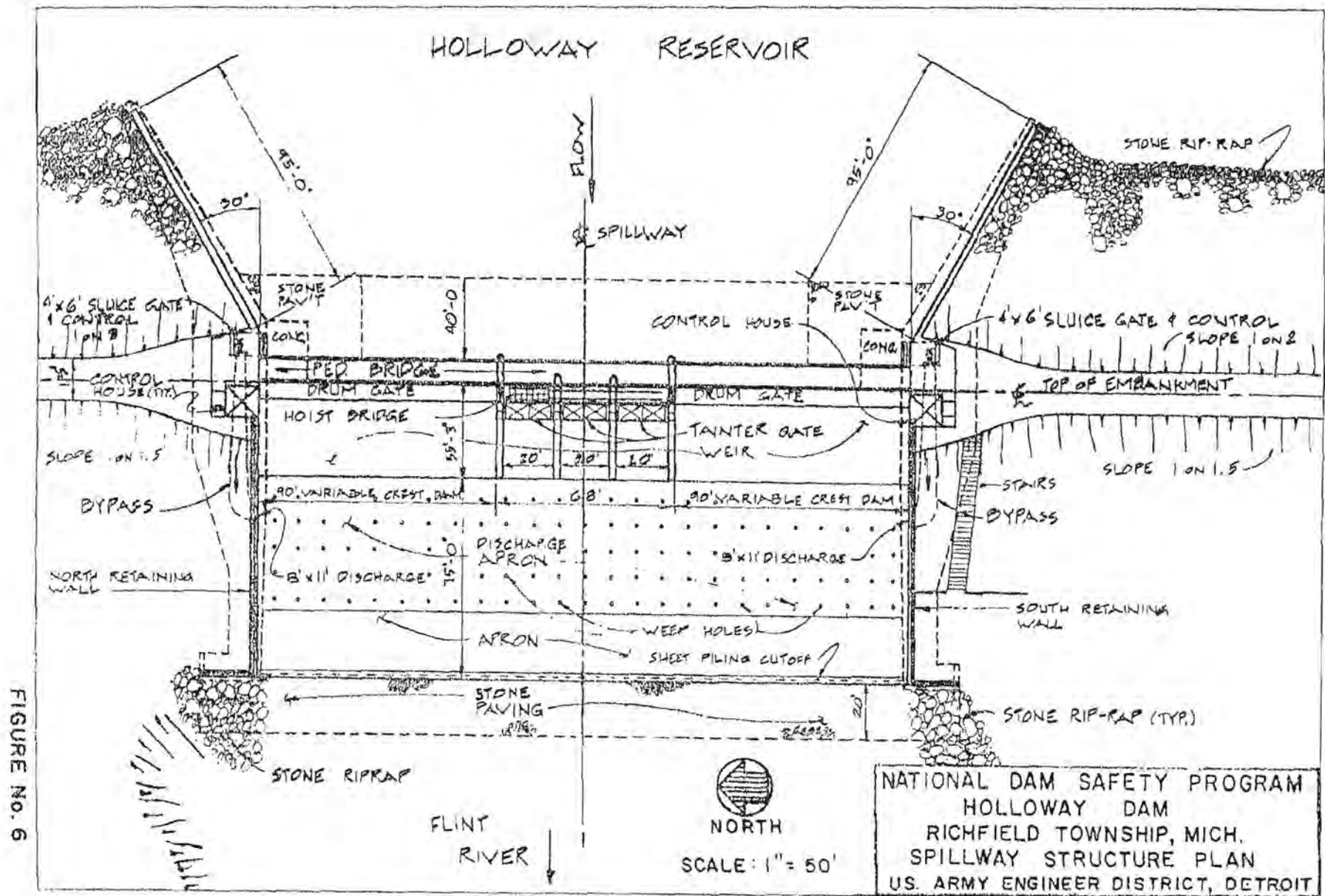
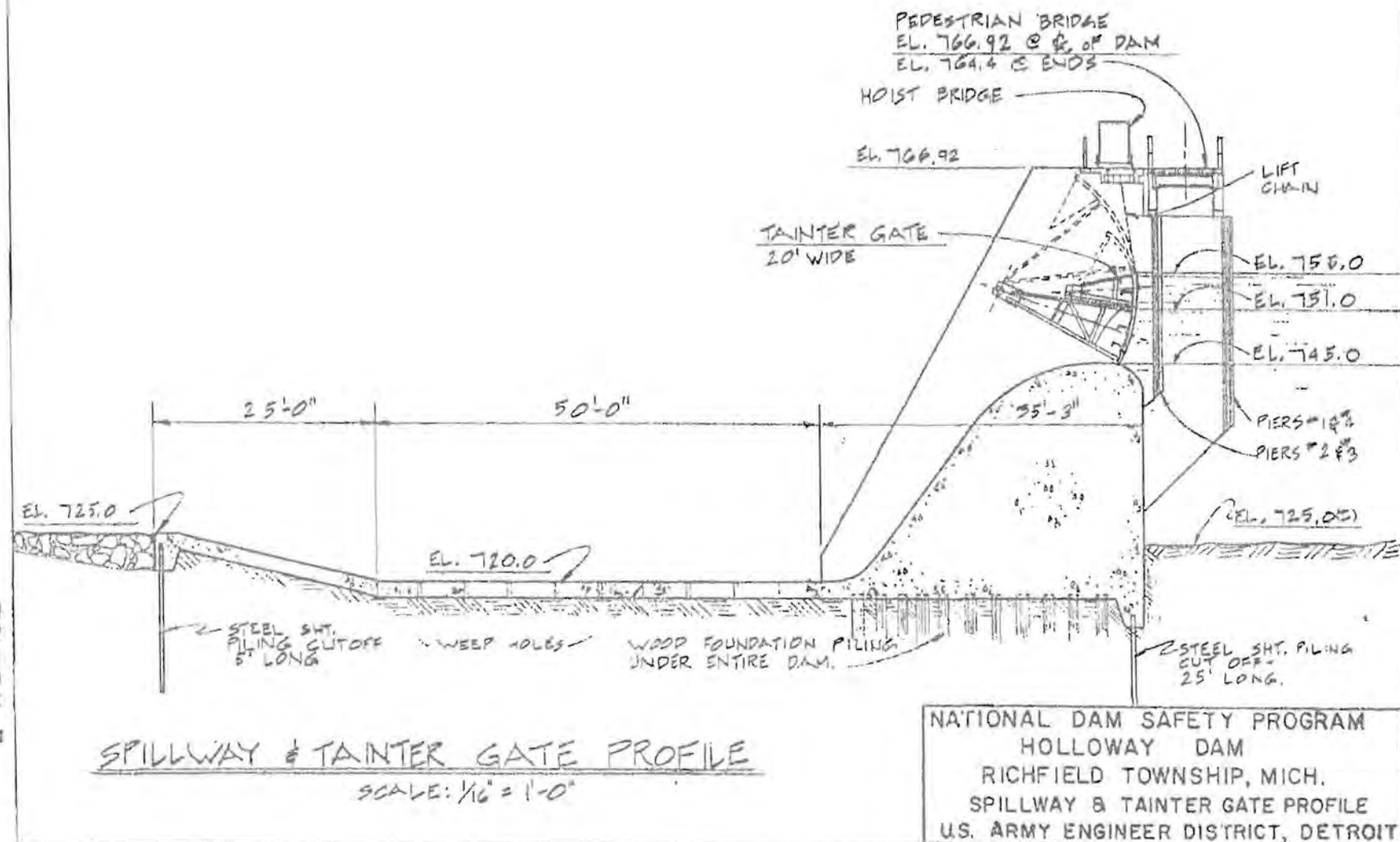
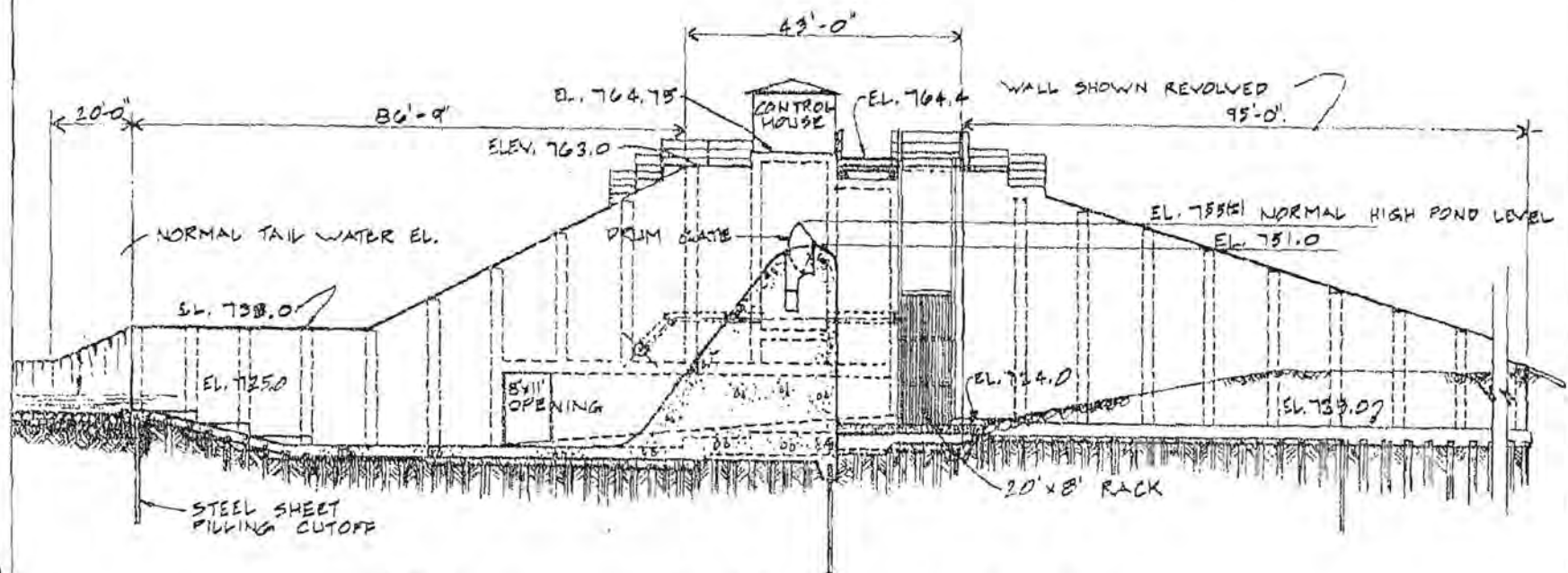


FIGURE NO. 6

FIGURE NO. 7

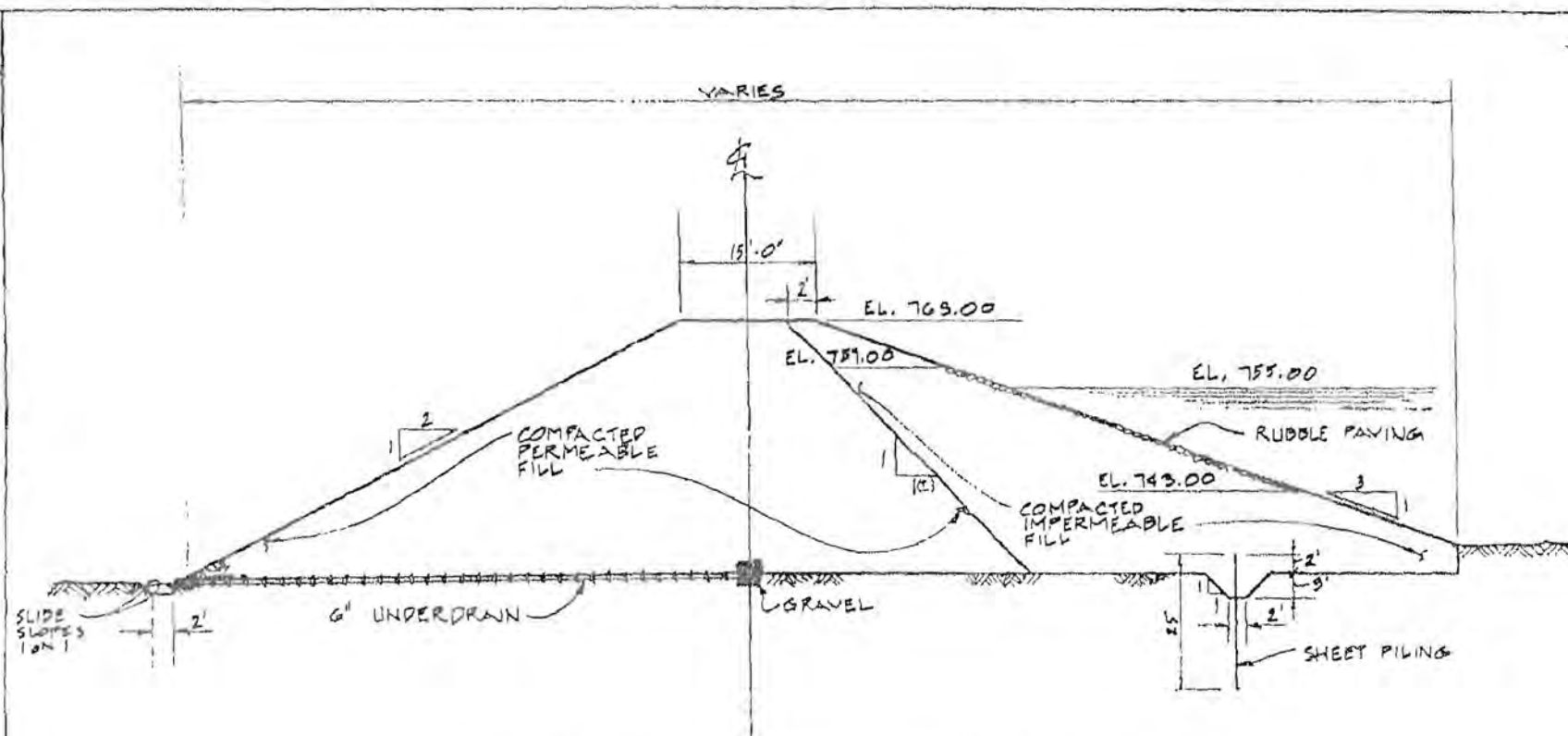




SPILLWAY AND DRUM GATE PROFILE
NO SCALE

NATIONAL DAM SAFETY PROGRAM
HOLLOWAY DAM
RICHFIELD TOWNSHIP, MICH.
SPILLWAY & DRUM GATE PROFILE
US ARMY ENGINEER DISTRICT, DETROIT

FIGURE NO. 8

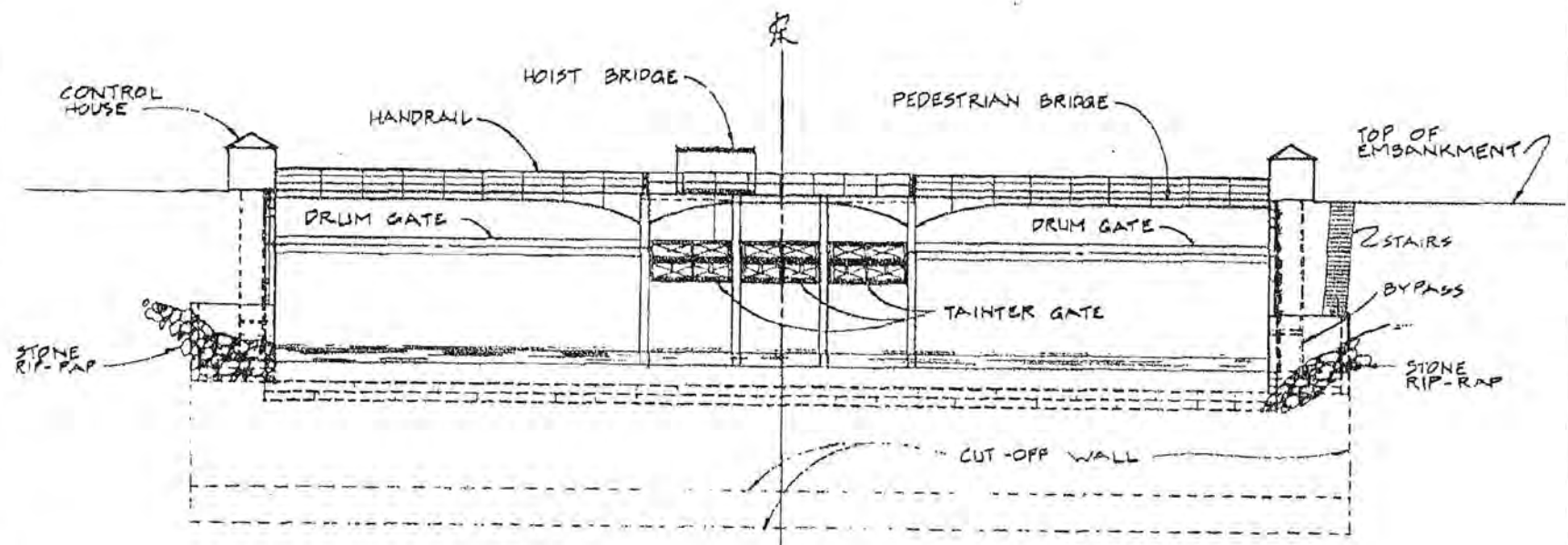


TYPICAL DAM SECTION

NO SCALE

NATIONAL DAM SAFETY PROGRAM
HOLLOWAY DAM
RICHFIELD TOWNSHIP, MICH.
EARTH EMBANKMENT PROFILE
U.S. ARMY ENGINEER DISTRICT, DETROIT

FIGURE NO. 9

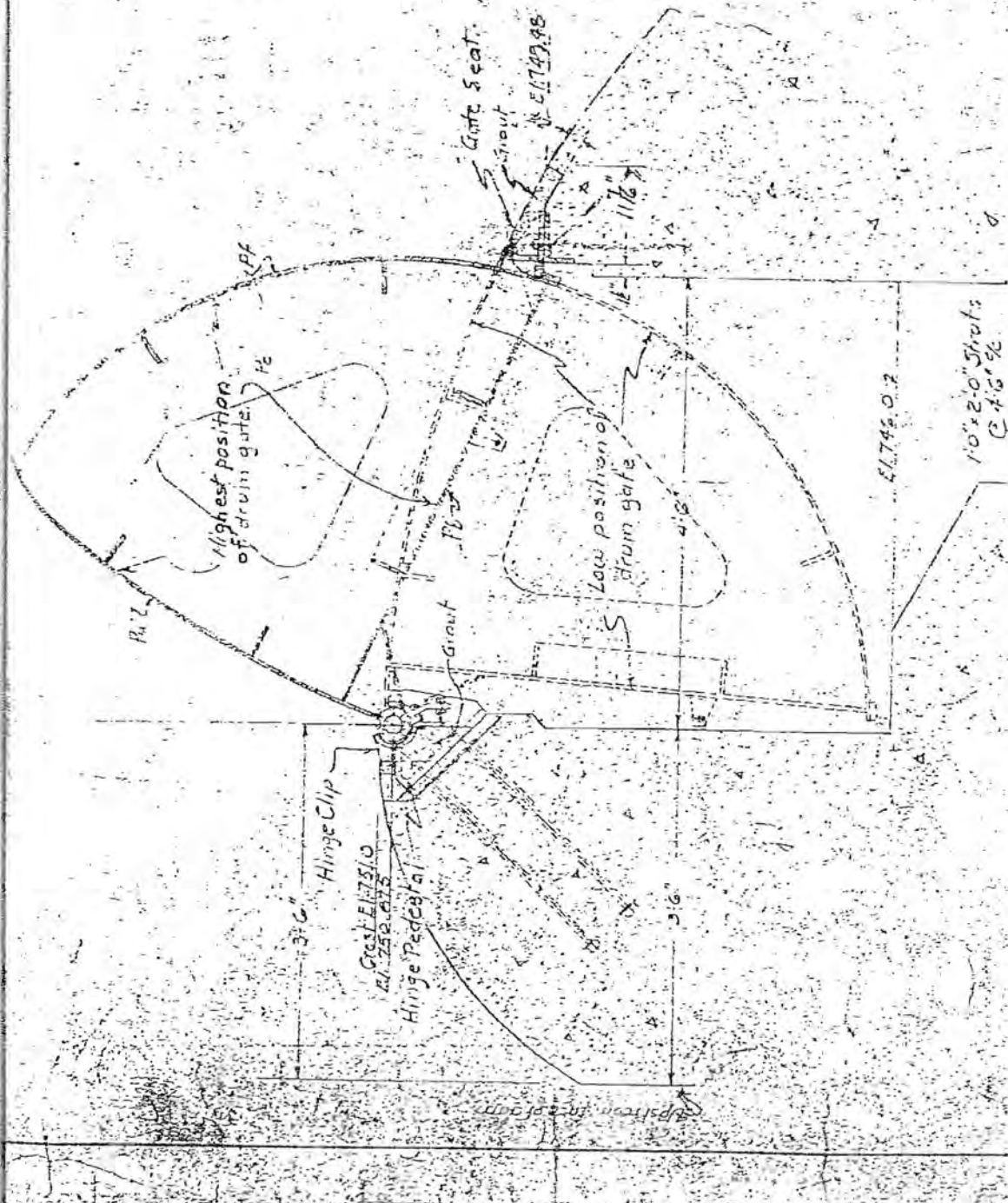


SPILLWAY ELEVATION VIEW

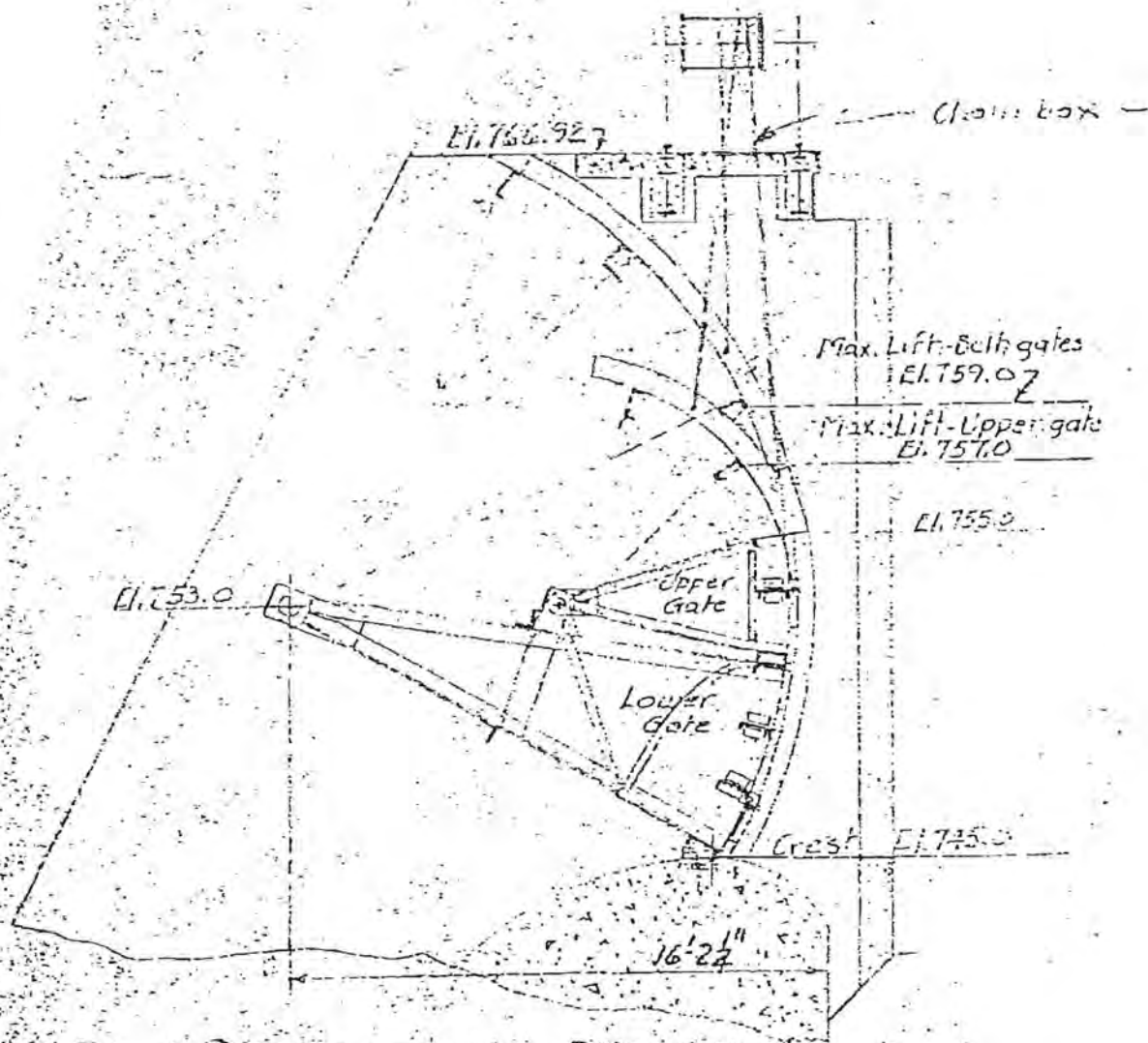
SCALE: 1" = 40'

FIGURE No. 10

NATIONAL DAM SAFETY PROGRAM
HOLLOWAY DAM
RICHFIELD TOWNSHIP, MICH.
SPILLWAY ELEVATION VIEW
U.S. ARMY ENGINEER DISTRICT, DETROIT



DRUM GATE SECTION



SECTIONAL ELEVATION
OF TAINTER GATE.

Appendix 5 - 2008 Holloway Dam Safety Report

MICHIGAN PUBLIC ACT 451, PART 315
INSPECTION REPORT
HOLLOWAY DAM
GENESEE COUNTY, MICHIGAN
INVENTORY NUMBER 064 – HIGH HAZARD

FOR

CITY OF FLINT
WATER TREATMENT PLANT
4500 N. DORT HIGHWAY
FLINT, MICHIGAN 48505
ATTN: MR BRENT WRIGHT
(810) 787-6537

BY

Stantec Consulting Michigan Inc.
Engineers – Planners – Surveyors
3959 Research Park Drive
Ann Arbor, Michigan 48108-2219
(734) 761-1010



INSPECTOR(S):

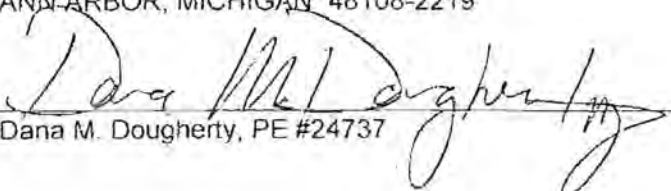
Dana M. Dougherty – Stantec Consulting Michigan Inc.

DATE OF INSPECTION:

October 19, 2008

PROFESSIONAL ENGINEER:

Dana M. Dougherty, PE
STANTEC CONSULTING MICHIGAN INC.
3959 RESEARCH PARK DRIVE
ANN-ARBOR, MICHIGAN 48108-2219


Dana M. Dougherty, PE #24737

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

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HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

1.0 Purpose and Authority

The purpose of the report is to present a summary of findings for the field inspection of the Holloway Dam completed by Stantec Consulting Michigan Inc. (Stantec) on October 19, 2008 pursuant to the requirements of Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994 P.A. 451, Section 31518.

This dam inspection Report and associated inspection activities were commissioned by the City of Flint, Michigan, the dam owner. The Holloway Dam is registered with the Michigan Department of Environmental Quality (MDEQ) as Dam Number 064.

References in the report to "left" and "right" are based on the observer facing downstream.

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

2.0 Conclusions and Recommendations

The Holloway Dam was inspected on October 19, 2008 in accordance with Michigan P.A. 451, Part 315 criteria. The dam, including spillway and embankments was found to be in good condition. A summary of comments/recommendations is as follows:

1. The City of Flint should continue their operation and maintenance procedures as outlined in the "Holloway Reservoir Operation and Maintenance Plan".
2. The Emergency Action Plan should be exercised annually and Notification List concurrently updated.
3. Small brush should be removed from the left and right embankments.
4. Minor spalls and cracks in the spillway concrete should be monitored. These do not require immediate correction, but should be planned and budgeted in the City's long term Capital Improvement Plan (CIP).
5. The seepage monitoring weirs should be placed back into operation by repairing the eroded channel. Periodic observations of seepage rates and observed fines deposition should be performed and logged for long term data comparison.
6. Warning signs on the concrete abutments should be re-painted.
7. The security fence in the downstream right embankment should be repaired.
8. Monitor the sloughed area in the downstream right embankment and repair as needed.
9. Further inspections should be performed in accordance with P.A. 451, Part 315 regulations.

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

3.0 Project Information

The Holloway Dam is located on the Flint River in Richfield Township, Genesee County, Michigan (Section 11, T8N, R5E). The dam and lower one fourth of the reservoir are in Genesee County while the upper three fourths of the reservoir are in Lapeer County. The dam was built in 1954 to maintain a base flow in the Flint River for water supply and sewage dilution requirements. The Holloway Dam was previously referred to as the Richfield Storage Dam. Presently the reservoir's uses are primarily, base water flow implementation, sewage dilution and recreation. The dam consists of earth embankments and a 248 ft long gated concrete spillway structure. The total length of the dam is approximately 3,350 ft between the natural moraine banks. The top of the embankment serves as a gravel road for maintenance purposes. A steel framed walkway spans the top of the spillway structure for operation and maintenance of the gates. The embankment side slopes are 3 horizontal to 1 vertical on the upstream face and 2 horizontal to 1 vertical on the downstream face.

3.1 PERTINENT DATA

The embankment is comprised of two zones: an upstream section and key trench of compacted impervious clay; and a larger downstream section of essentially granular material, predominantly sand with some gravel.

The plans show a sheet pile cutoff wall along the full length of the dam near the upstream toe, extending 23 ft below the base of the embankment and two feet into the embankment. A subdrain system, originating just downstream of the centerline of the crest and transverse to the dam axis, is also shown. The plans indicate that this subdrain system is formed by tile drain pipes with a center-to-center drain spacing of 15 ft. Plan details indicate a graded filter surrounding the tile drain pipes. The pipes empty into a collection ditch at the toe of the downstream slope. The right embankment has been modified by installation of fill at the toe with a bench located mid point on the slope. Weep drains were extended with 6" PVC pipe.

The outlet works of the dam consist of a reinforced concrete spillway controlled by seven gates. There is a control house on each end of the spillway. A telemark water level recording gage is in the left control house.

The following is a tabulation of principal data obtained from the construction drawings.

Hazard Classification – High (per 1978 USACE report).

Length of Dam – Overall length of the dam including the concrete spillway structure and the right and left embankments is approximately 3,350 ft.

Stantec
HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

Project Information
December 2008

Height of Dam – The total height of the dam, defined in P.A. 451, Part 315 as the difference in elevation between the natural stream bed and the design flood elevation, is approximately 30 ft. the crest of the dam is at El. 763.0 ft.

Crest Width of Embankments – Approximately 15 ft.

Side Slopes – The earth embankments have 3.0 H to 1.0 V slopes on the upstream face and 2.0 H to 1.0 V slopes on the downstream face. The right embankment downstream slope has been modified with fill at the toe and a bench at midpoint.

Spillway: 248 ft long concrete spillway structure with:

- a) two 90 ft long drum gates
- b) three 20 ft long tainter gates
- c) two 4 ft by 6 ft sluice gates perpendicular to the dam axis
- d) 75 ft by 248 ft wide discharge apron

Cutoff: 25 ft deep steel sheet pile cutoff wall at the upstream toe of the full length of the dam, and 15 ft deep steel sheet pile cutoff wall along the downstream side of the spillway structure.

Embankments: Upstream section and key trench of compacted impervious clay and a larger downstream section of granular material, predominantly sand with some gravel.

Further details of the spillway structure and embankments are shown in **Appendix A**. These figures have been taken from the 1978 Phase I Inspection Report.

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

4.0 Field Inspection

An inspection of the facilities was performed by Dana M. Dougherty, PE (Stantec) on October 19, 2008. The weather on the date of inspection was clear with temperature at approximately 55°F. The impoundment elevation was near normal (summer) i.e. 755. Flow was passing over the drum gates as well as through the left (looking downstream) sluiceway.

The following items were noted: (Referenced photographs can be found in Appendix C.)

4.1 SPILLWAY

Overall the spillway appeared to be in excellent condition. Recent preventative maintenance work includes painting of miscellaneous metals including handrails, gates, and support beams, installation of new galvanized steel grating on the gate operator platform and patching concrete at the upper downstream end of the taintor gate piers.

Some minor items were noted with regard to concrete condition including:

1. There was spalled concrete on the top of the upstream right wingwall. The face of the wall exhibited cracking and efflorescence at this location (Ref. Photos #3 and #4).
2. There was a small crack in the right abutment immediately above the drum gate. There is no evidence of movement or displacement at this crack (Ref. Photo #6). This should be monitored.
3. Minor alligator cracking was noted in the taintor gate piers (Ref. Photos #7 and #8). These do not pose any immediate concern but should be monitored.
4. There were cracks in the left abutment and left downstream retaining walls. No displacement was noted. These cracks should be monitored for future movement (Ref. Photos #9 and #10).
5. The upper portion of the downstream end of the left downstream retaining wall has alligator cracking and efflorescence. This should be monitored (Ref. Photo #12).
6. The warning signs that are painted on the upstream abutment/wingwall faces are faded and difficult to read. These should be repainted.

4.2 RIGHT EMBANKMENT

Overall the condition of the right embankment appears to be good with no significant erosion, seepage, settlement, sloughing or animal burrows noted. The following specific items were noted:

Stantec**HOLLOWAY DAM****CITY OF FLINT****GENESEE COUNTY, MICHIGAN**

Field Inspection

December 2008

1. There was a minor amount of erosion beneath the riprap on the upstream embankment face immediately adjacent to the spillway.
2. Some brush has begun to grow on the upstream slope. This should be selectively removed (Ref Photos #14 and #16). Small natural growth such as wildflowers and grasses should remain.
3. Considerable brush was observed on the downstream embankment face and within the toe-of-slope drain. This should be removed (Ref. Photos #17 and #20).
4. For the most part weep tiles are dry. There is one section midway in the embankment where the weep tiles are active. Some sloughing of the slope was observed in this area. It appeared that this has been addressed through addition of a blanket drain with geotextile fabric. This should be monitored for further displacement.
5. A short section of the security fence was in disrepair. This should be corrected (Ref. Photo #23).
6. The seepage monitoring weir is not functioning. Flow was passing around the weir through an eroded section. This should be corrected (Ref. Photo #24).

4.3 LEFT EMBANKMENT

The observed condition of the left embankment was good to excellent. There was no evidence of significant erosion, seepage, settlement, sloughing or animal burrows. The following specific items were noted:

1. A minor amount of small brush should be removed from the downstream slope (Ref. Photo #28).
2. There was no evidence of seepage from the weep drains, however the toe-of-slope drain was flowing, in particular the final 100 ft (Ref. Photo #29).
3. The seepage monitoring weir is not functioning similar to the right side. Flow was passing around the weir through an eroded section. This should be corrected (Ref. Photo #30).

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

5.0 Structural Stability

The assessment of stability is based on visual observations made during our field inspection (10/19/08).

No deficiencies were noted that would impact the structural integrity of the dam; however minor items were noted that should be proactively addressed to mitigate potential future deficiencies. Over all the condition of the facility remains good.

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

6.0 Hydrology and Hydraulics

The MDEQ has estimated the required spillway capacity at the Holloway Dam to be 9900 cfs (reference **Appendix B**). This equates to the 200 year frequency flood which is mandated by statute – P.A. 451, Part 315, Section 324.31516.

Headwater rating curves previously produced by the USACE (1978) and Acres International (1993) indicate that this discharge capacity can be met at an impoundment elevation of approximately 755. This would allow for approximately 8 feet of freeboard. Thus, the spillway discharge capacity is sufficient to meet P.A. 451, Part 315 requirements. Furthermore, the spillway capacity at overtopping (El. 763) is approximately 40,000 cfs or $\frac{1}{2}$ PMF.

The spillway capacity has also been determined with the assumption that the drum gates fail to operate and are locked in the up position (reference Ayres, Lewis, Norris & May, Inc. (ALNM) Report – 1996). The resultant 200 year impoundment elevation is computed to be approximately 761 or two feet of freeboard. Therefore, the required spillway design capacity can be met through operation of the taintor gates only.

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

7.0 Operation and Maintenance

The dam is operated and maintained by staff from the City of Flint Water Treatment Plant. Routine operation and maintenance is performed in accordance with the Holloway Reservoir Operation and Maintenance Plan which is on file at the City of Flint WTP.

Impoundment elevation is continuously monitored via an on-site level transducer. Instantaneous level information is available remotely to assist operations personnel in maintenance of the impoundment elevation.

During summer months, the drum gates are in a raised position and taintor gates closed. The impoundment elevation is maintained between 755.0 and 755.75 by operating the drum and/or taintor gates as needed.

The impoundment elevation is lowered in the winter to approximately elevation 751.0. The drum gates are lowered during this period.

Emergency backup power is available to operate the taintor gates in case of a power loss. An *Auxiliary Generator Power System Report* is available at the WTP.

The City has performed routine maintenance of the facilities on an "as needed" basis. The most recent work consisted of painting exposed steel components including the taintor gates and access platform support steel.

In addition to routine surveillance by operations staff, supervisor staff also performs an annual inspection of the facilities. Noted deficiencies are scheduled for correction the following year.

Appendix 6 - 2008 Utah Dam Safety Report

MICHIGAN PUBLIC ACT 451, PART 315
INSPECTION REPORT
UTAH DAM
GENESEE COUNTY, MICHIGAN
INVENTORY NUMBER 1275 - LOW HAZARD

FOR

CITY OF FLINT
WATER TREATMENT PLANT
4500 N. DORT HIGHWAY
FLINT, MICHIGAN 48505
ATTN: MR BRENT WRIGHT
(810) 787-6537

BY

Stantec Consulting Michigan Inc.
Engineers - Planners - Surveyors
3959 Research Park Drive
Ann Arbor, Michigan 48108-2219
(734) 761-1010



INSPECTOR(S):

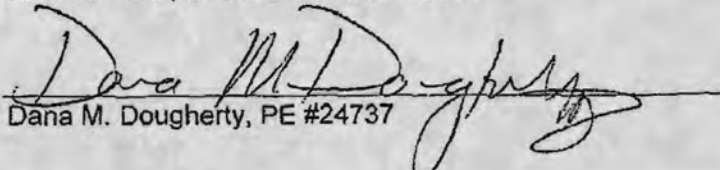
Dana M. Dougherty - Stantec Consulting Michigan Inc.

DATE OF INSPECTION:

October 19, 2008

PROFESSIONAL ENGINEER:

Dana M. Dougherty, PE
STANTEC CONSULTING MICHIGAN INC.
3959 RESEARCH PARK DRIVE
ANN ARBOR, MICHIGAN 48108-2219


Dana M. Dougherty, PE #24737

Stantec

**INSPECTION REPORT
UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN**

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UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

1.0 Purpose and Authority

The purpose of the report is to present a summary of findings for the field inspection of the Utah Dam completed by Stantec Consulting Michigan Inc. (Stantec) on October 19, 2008 pursuant to the requirements of Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994 P.A. 451, Section 31518.

This dam inspection Report and associated inspection activities were commissioned by the City of Flint, Michigan, the dam owner. The Utah Dam is registered with the Michigan Department of Environmental Quality (MDEQ) as Dam Number 11275.

References in the report to "left" and "right" are based on the observer facing downstream.

**UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN**

2.0 Conclusions and Recommendations

The Utah Dam was inspected on October 19, 2008 in accordance with Michigan P.A. 451, Part 315 criteria. The dam was found to be in fair to poor condition. A summary of comments/recommendations is as follows:

1. The stability of the exposed portion of the structure is poor and is no longer capable of serving its intended purpose.
2. The operating components of the facility (floodgates) have been decommissioned for sometime and are no longer functional.
3. The purpose of the dam (impound water for the upstream water treatment plant) is no longer needed as the Hamilton Dam, which is located downstream, provides this capability.
4. The Hamilton Dam is currently being evaluated for potential reconstruction and should the decision be made to proceed with that project the Utah Dam will serve no useful future function.
5. The spillway hydraulic capacity is deficient with regard to P.A. 451, Part 315, Section 324.31516 rules. This is further exacerbated by the fact that the partially open gates impede high flows resulting in an increased backwater.
6. The City should consider full or partial removal of the dam. It is possible that the foundation and submerged portion of the piers may be reused to support a new pedestrian crossing bridge. The minimum removal effort would consist of removing the gates from the dam. Due to the aforementioned deficiencies and related public safety liabilities the City should take immediate action perhaps concurrent with the proposed Hamilton Dam reconstruction.

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

3.0 Project Information

Utah Dam is located on the Flint River in the City of Flint, Genesee County, Michigan (T08N, R07E, Section 32) at the south end of Whaley Park. The site location map is shown in Appendix A.

Utah Dam is owned by the City of Flint and plans for the dam are on file with the City. It was designed by the Ambursen Dam Company of New York and San Francisco and built around 1928. The dam was constructed to maintain a reservoir at El. 711 to provide sufficient head on the City's water treatment plant intake pipe. The pool created by the dam was limited to the main channel of the Flint River. The dam was built between the two banks of the river and has a total length of 240 ft. It consists of a concrete gravity structure with six spillway bays and 4 ft wide piers. Each bay has a 12 ft high by 25 ft long vertical lift gate.

There are two bridge decks on the structure. The upper deck is approximately 11 ft wide and it is used to move the gate hoist along the length of the dam. The gate hoist travels the length of the dam on two No. 40 rails, each of which is supported by 15 inch "I" beams. The beams are supported by the piers.

The lower bridge deck is separated by the vertical lift gates. The downstream side of the deck is 7 ft wide and it serves as a pedestrian walkway. The upstream side of the deck is 5 ft wide and it is used by the operator to gain access to the upper deck via a steel ladder.

Presently, the dam serves as a walkway over the Flint River and as a backup for Hamilton dam for providing a head on the water intake pipe. The gates of Utah Dam are currently locked open above the normal backwater elevation created by Hamilton Dam, which is 2.2 miles downstream. Elevations given in this report are referenced to National Geodetic Vertical Datum.

Six spillway bays and vertical lift gates are contained within the structure. Pertinent data about Utah Dam is give below.

Height of Dam – The total height of the dam, defined in P.A. 451, Part 315 as the difference in elevation between the natural stream bed (El. 696.8 ft) and the design flood elevation (El. 717.2 ft) is approximately 20.4 ft.

Crest Width of Structure – 30 ft as measured along the lower deck.

Sill of Vertical Lift Gates – El. 697.3 ft.

Sketches of the dam are included in Appendix A.

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

4.0 Field Inspection

An inspection of the facilities was performed by Dana M. Dougherty, P.E. (Stantec) on October 19, 2008. The weather on the date of inspection was clear with temperature at approximately 55°F. The impoundment elevation was approximately 1.9 ft below normal elevation. The City was in the process of lowering the Hamilton Dam impoundment per directive from the MDEQ. This directive requires that the Hamilton Dam impoundment be lowered 3.25 ft.

The following items were noted (Reference photographs can be found in Appendix C):

1. The concrete condition on the downstream face of the dam is fair to poor. The right downstream retaining wall shows significant spalling in its top and outside corner. The left downstream retaining wall has significant spalling and cracking. The pier noses (three of five) are spalled. The access platform or walkway on the dam, concrete is in fair to poor condition. There is effervescence and cracking in the access platform support beams. There is no displacement. (Ref. Photos #1 and #5.)
2. The concrete condition of the upstream dam face is fair to poor. The noses of all piers show effervescence and some alligator cracking. This is also true for the right and left upstream retaining walls. There does not appear to be any substantial structural cracking in any of these members or displacement. There is spalling of concrete at the top of the piers as well as at the top of the abutment walls where the access platform rests. There is also some indication of spalling in the access platform beams and in some cases at the bottom of the beams themselves (Ref. Photos #2 and #6).
3. The gates are randomly open. The left gate, Bay No. 1, is 2 feet above the water level on this date. Bay No. 2 and No. 3 from the left, are 4 feet above water level on this date and Bay No. 4, 5, and 6 are 6.5 feet above water level. All dimensions reference water level to the bottom of the gate.
4. The superstructure appears to be in very poor condition. Concrete is in fair to poor condition. The operating platform, which housed a single moveable gantry crane for all six gates, has spalling in the beams as well as the piers. Protective railings are all intact, but in poor condition and require painting (Ref. Photos #7 and #8).
5. The top of the right embankment has a paved walkway with chain link fence on either side of the walkway. This is also true for the left embankment. There is also lighting at the site, utility poles in each embankment with a light fixture (Ref. Photos #3 and #4).
6. The embankments have some tree growth which should be removed.

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN
Field Inspection
December 2008

7. On the date of the inspection, the water level is about 10.6 feet below the operating/walkway platform (El. 706.6 NGVD).
8. There is a 4 foot wide opening in the fence on the left downstream face of the dam, next to the utility pole, which allows access and is a safety issue. Also, the safety fencing that was installed on the upstream side of the dam, between the walkway and the gates, has been removed and is a safety issue.

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

5.0 Structural Stability

The assessment of stability is based on visual observations made during our field inspection (10/10/08).

The overall structural condition of the Utah Dam is categorized to be fair to poor. Substantial deteriorated concrete is evident with numerous spalls, cracks, and some exposed reinforcing steel. The superstructure concrete is in the poorest condition with the gate lift support structure no longer capable of supporting its intended function i.e. gate operation.

The condition of the access platforms and exposed portions of the piers is somewhat better than the superstructure but still would be categorized as poor. The submerged portion of the piers and foundation were not inspected as part of this report, however experience with similar structures would imply that their condition would be better than the exposed components.

In conclusion, the Utah Dam structural stability will no longer support gate operation. Furthermore, continued use of the access platforms for pedestrian crossing will be dependent on future evaluation, repair and/or modification of those components.

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

6.0 Hydrology and Hydraulics

The MDEQ has established the required spillway capacity at the Utah Dam to be 11,800 cfs (reference **Appendix B**). This equates to the 100 year frequency flood which is mandated by statute, P.A. 451, Part 315, Section 324.31516, for dams classified as low hazard such as the Utah Dam.

The hydraulic capacity of the Utah Dam is greatly impacted by the downstream Hamilton Dam. The normal impoundment elevation of the Hamilton Dam impoundment is approximately El. 708.0 (NGVD) while the gate sill elevation of the Utah Dam is 697.3. Thus, the Utah Dam is partially submerged under normal conditions.

Overtopping of the right embankment occurs at or near El. 714.0. The 1993 Acres Report (**Appendix B**) indicates that overtopping of this embankment will be experienced at flows over 7,830 cfs. The FEMA Flood Insurance Study (**Appendix B**) shows the 100 year flood elevation at the Utah Dam to be approximately El. 716.0. Thus the right embankment is overtopped under high flow conditions due to backwater impacts from the Hamilton Dam. It should be noted that the FEMA Flood Insurance Study assumes that all six gates are operable at Hamilton Dam. Since 1991 only three gates have been operable thus the backwater impact would be greater than shown on the FEMA maps.

The Utah Dam's hydraulic capacity is further diminished by the fact that the floodgates are currently locked in a partially open position. The bottom of gate elevation for each bay (numbered left to right locking downstream) is approximately:

Bay No. 1	708.5
Bays No. 2 and 3	710.5
Bays No. 4 through 6	713.0

Under high flows (100 year El. 716.0) the gates will impede flow thereby further exacerbating flood conditions.

For the above described reasons, it is concluded that the Utah Dam does not meet spillway capacity requirements as required by statute.

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

7.0 Operation and Maintenance

The Utah Dam is operated and maintained by staff from the City of Flint Water Treatment Plant. The floodgates are currently non-functional and are locked in a partially open position. Power has been disconnected from the gate operators. The impoundment elevation is maintained by the downstream Hamilton Dam thereby negating the usefulness of the Utah Dam.

The City staff therefore maintains a minimal surveillance effort at the dam. Minimal preventative maintenance has been performed in the recent past. It is the City's intent to remove all or a portion of the structure as funds become available. Until that time maintenance will be limited to those items necessary to insure public safety with regard to the pedestrian bridge crossing.

Appendix 7 - 2008 Hamilton Dam Safety Report

MICHIGAN PUBLIC ACT 451, PART 315
INSPECTION REPORT
HAMILTON DAM
GENESEE COUNTY, MICHIGAN
INVENTORY NUMBER 060 – HIGH HAZARD

FOR

CITY OF FLINT
WATER TREATMENT PLANT
4500 N. DORT HIGHWAY
FLINT, MICHIGAN 48505
ATTN: MR BRENT WRIGHT
(810) 787-6537

BY

Stantec Consulting Michigan Inc.
Engineers – Planners – Surveyors
3959 Research Park Drive
Ann Arbor, Michigan 48108-2219
(734) 761-1010



INSPECTOR(S):

Dana M. Dougherty – Stantec Consulting Michigan Inc.

DATE OF INSPECTION:

October 19, 2008

PROFESSIONAL ENGINEER:

Dana M. Dougherty, PE
STANTEC CONSULTING MICHIGAN INC.
3959 RESEARCH PARK DRIVE
ANN ARBOR, MICHIGAN 48108-2219


Dana M. Dougherty, PE #24737

Stantec
INSPECTION REPORT
HAMILTON DAM
 CITY OF FLINT
 GENESEE COUNTY, MICHIGAN

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3. Acres International (1993) Headwater Rating Curve
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5. Stantec (2008) Headwater Curve Computations

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Stantec
INSPECTION REPORT
HAMILTON DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

1.0 PURPOSE AND AUTHORITY

The purpose of this report is to present a summary of findings for the field inspection of the Hamilton Dam completed by Stantec Consulting Michigan Inc. on October 19, 2008 pursuant to the requirements of Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994 P.A. 451, Section 31518.

This Dam Inspection Report and associated inspection activities were commissioned by the City of Flint, the dam owner. The Hamilton Dam is registered with the Michigan Department of Environmental Quality (MDEQ) as Dam Number 060.

References in this report to "left" and "right" are based on the observer facing downstream.

Stantec**INSPECTION REPORT****HAMILTON DAM****CITY OF FLINT****GENESEE COUNTY, MICHIGAN****2.0 CONCLUSIONS AND RECOMMENDATIONS**

The Hamilton Dam was inspected on October 19, 2008 in accordance with the Michigan P.A. 415, Part 315 criteria. The dam was found to be in poor condition which supports the conclusion found in previous dam safety reports. Specific comments/recommendations are as follows:

1. The stability of the exposed structural components including gate piers, access and operating platforms, and abutments is poor. These components are no longer capable of serving their intended purpose.
2. Three of the floodgates have been decommissioned while the reliability of the remaining gates is suspect. With three gates operating inadequate freeboard exists at the right embankment (looking downstream). In addition upstream flood elevations will be greater than those included in the FMEA Flood Insurance maps.
3. The MDEQ mandated drawdown should be adhered to until the dam is reconstructed.
4. The City should proceed immediately to implement the preferred option from the 2008 Reconstruction Feasibility Study.
5. In the interim, the City should exercise the Emergency Action Plan (EAP) annually to insure an efficient implementation when and if needed.

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INSPECTION REPORT
HAMILTON DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

3.0 PROJECT INFORMATION

Hamilton Dam is located on the Flint River in downtown Flint, Michigan near the Flint Branch of the University of Michigan campus, and approximately 800 ft. upstream from the Saginaw Street Bridge.

Plans for the current dam are on file with the City of Flint, but original design data is not available. The dam was designed by Fargo Engineering Company of Jackson, Michigan, and was constructed about 1920 by Price Brothers Company of Lansing, Michigan on the site of a previous mill dam. The dam was constructed to sustain a head for the upstream water treatment plant intake.

The existing structure is a reinforced concrete gravity dam with six gated spillway bays. Each bay has a tainter gate on the fixed crest of a concrete spillway. The six bays, each 33 ft. long, and the five piers, each four feet thick, make a total length of 218 ft. There is an end sill below the spillway and an 18 ft. concrete apron beyond the end sill. The gates are operated during flood flows.

The original 1920 dam had seven bays with tainter gates. In 1964, the southern (left) most gate, its spillway and headrace were removed.

A fish ladder was constructed through the right abutment sidewalls in 1978. Also in 1978, the right concrete abutment was modified to install an Archimedean screw pump.

Repairs to Hamilton Dam were carried out in the summer of 1992. Steel sheet piling was placed just upstream of the gates for Bays 1, 2 and 6 because of the deteriorated condition of the gates. The sheet piles were to maintain the headpond in case of gate failure. The top elevation of the sheet piles was placed near the top of the tainter gates (Elev. 707.8 ft.) in a closed position. Gate repairs were completed in Bays 3, 4, and 5. These repairs included the complete removal of the existing gates and replacement with new gates, repair of buttress and sill concrete, repair of gate trunnions, replacement of lift chains, and painting of all exposed gate steel.

The top deck of the structure is divided lengthwise into a pedestrian walkway and the gate hoist rails for the two gate hoists. The hoist rails consist of two "I" beams (18 inch and 15 inch) that are supported by the piers. The two hoists for raising the spillway tainter gates are driven by attached electric motors.

A U.S. Army Corps of Engineer's bronze disk is set flush with the bridge deck in the walkway at the second pier from the right end. Unless otherwise noted, data given in this report is based on the assumption that the E1 715.06 ft. elevation given for this benchmark is on National Geodetic Vertical Datum (NGVD).

Stantec**INSPECTION REPORT****HAMILTON DAM****CITY OF FLINT****GENESEE COUNTY, MICHIGAN****PROJECT INFORMATION**December 2008

The terrain near the dam and reservoir is urban and gently rolling. Five borings from the original plans show sand with an occasional pocket of clay or gravel in the soils overlying a soft sandstone which is 40 or 50 ft. below ground surface.

Six spillway bays and tainter gates make up the structure. Only Gates 3, 4 and 5 are currently operable. Sketches and pertinent data about Hamilton Dam are shown in **Appendix A**.

Hamilton Dam was classified by the U.S. Army Corp of Engineers as High Hazard in the 1980 Phase I Inspection Report. This classification remains in effect to date.

Plans for the original Dam construction in 1920 and plans for repairs performed in 1992 are on file with the City of Flint. Past inspection reports on file include the following:

- 1980 USACE, Phase I, National Dam Safety Program Report
- 1986 Ayres, Lewis, Norris & May, Inc. (ALNM) and Sublakes Diving Inspection Report
- 1988 MDNR Inspection Report
- 1989 Ayres, Lewis, Norris & May, Inc. (ALNM) Structural Evaluation and Reconstruction of Hamilton Dam Report
- 1993 Acres International Corp., Dam Inspection Report
- 1996 Ayres, Lewis, Norris & May, Inc. (ALNM) Inspection Report
- 1999 Paul C. Rizzo Associates, Inc. Dam Inspection Report
- 2000 USACE Hamilton Dam Condition Survey
- 2005 Soil & Materials Engineers, Inc. Dam Inspection Report
- 2008 Stantec Feasibility Study for Reconstruction

These reports have been consistent in their recommendations to undertake corrective action to address structural deficiencies within the facility. The 1989 Ayres, Lewis, Norris & May, Inc. (ALNM) and 2000 USACE Reports included estimated costs of \$3,830,000 and \$5,588,000 respectively to make the necessary improvements to insure dam safety and integrity. The 2008 Stantec Report estimated the reconstruction cost to be \$4,901,000.

On March 14, 2008, acting under the authority of Part 315, Dam Safety of the Natural Resources and Environmental Protection Act, 1994 P.A. 451 as amended, the Michigan

Stantec**INSPECTION REPORT
HAMILTON DAM****CITY OF FLINT****GENESEE COUNTY, MICHIGAN****PROJECT INFORMATION****December 2008**

Department of Environmental Quality issued an order to the City of Flint to drawdown the Hamilton impoundment 3.25 ft. to an elevation not greater than 705.25 NGVD for the purpose of public health, welfare and safety protection. The depth of necessary drawdown was computed by the MDEQ to eliminate the danger of loss of life downstream in the event of a sudden dam failure.

A permit under Part 301, Inland Lakes and Streams was issued for this activity on September 30, 2008. The City of Flint has subsequently abided by the conditions of this permit and has lowered the normal impoundment elevation to the prescribed elevation. It should also be noted that the MDEQ permit requires permanent deflation of the Obermeyer (Inflatable) Dam.

Stantec
INSPECTION REPORT
HAMILTON DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

4.0 FIELD INSPECTION

An inspection of the facilities was performed on October 19, 2008 by Dana M. Dougherty, PE. The weather on the date of the inspection was clear with temperatures at approximately 55°F. The impoundment elevation was below normal by approximately 1.5 ft. The City was in the process of lowering the impoundment per directive from the MDEQ. This directive requires that the impoundment be lowered 3.25 ft. The floodgate in Bay #3 has been opened to accomplish this task.

The following items were noted during the field inspection (referenced photographs can be found in Appendix C):

1. The condition of the exposed concrete including piers, slabs, abutments is poor with numerous spalls, cracks and exposed reinforcing steel (Ref. Photos #1 through #4, #7, #8, #10).
2. The floodgates in Bays 1, 2 and 6 have been decommissioned by placement of steel sheeting across the face of these bays (Ref. Photos #2 and #8).
3. The City reports that the remaining floodgates (Bays 3 through 5) are operative, however, Bays 4 and 5 have not been operated with any frequency and thus their reliability is suspect.
4. The access walkway/platform remains closed to the public due to safety concerns (Ref. Photos #3 and #4).
5. Overall the condition of the dam continues to worsen with the structural integrity of numerous components compromised.

Stantec
INSPECTION REPORT
HAMILTON DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

5.0 STRUCTURAL STABILITY

The assessment of stability is based on a visual observation made during our field inspection (10/19/08) and visual observations made during preparation of the 2008 Reconstruction Feasibility Study, as well as the 1989 condition survey (concrete corings).

The overall structural condition of the Hamilton Dam is poor. Exposed surfaces including gate piers, access and operating platforms and abutments all exhibit conditions that indicate these components have exceeded their useful life. Numerous spalls, cracks and exposed reinforcing steel exist.

In conclusion, the Hamilton Dam structural stability is deficient and thus this facility represents a potential liability with regard to public health, welfare and safety.

Stantec
INSPECTION REPORT
HAMILTON DAM
 CITY OF FLINT
 GENESEE COUNTY, MICHIGAN

6.0 HYDROLOGY AND HYDRAULICS

The dam is regulated under State of Michigan P.A. 451 Part 315 statute. Guidelines that accompany this statute require high hazard potential dams with heights less than 40 ft. to be capable of passing a 200-year flood or the flood of record whichever is greater. For the Hamilton Dam, the 200-year flood controls and has been computed by the Michigan Department of Environmental Quality to be 13,000 cfs (reference **Appendix B**).

The computed maximum impoundment elevation for the 200-year flood event varies dependent on assumptions made with regard to the number of floodgates that are operative. In 1981, calculations were performed by the United States Geologic Survey and form the basis for the FEMA Flood Insurance mapping that is used to this day. The USGS assumed that all six floodgates were operational. The USACE also computed the maximum impoundment elevation in their 1981 National Dam Safety Inspection Report. They assumed that just two gates were operational due to the fact that the gates could not be locked in an open position and only two operators existed. In 1993 after decommissioning of Gates 1, 2 and 6, Acres International Corporation computed the maximum headwater elevation assuming that gates were operational in Bays 3, 4 and 5.

The results of these various studies is as follows (refer to **Appendix B** for more information):

Source	Estimated 200-year Impoundment Elevation NGVD Datum
1981 F.I.S. (U.S.G.S.)	709.05*
1981 Dam Safety Inspection Report (USACE)	711.6
1993 Dam Safety Inspection Report (ACRES)	712.8

* USGS added 0.95' to the computed impoundment elevation for the purpose of floodplain mapping. Therefore the floodplain mapping indicates a 200-year flood elevation of approximately 710.0 NGVD.

It should be noted that there is uncertainty as to whether or not adequate freeboard exists at this site. The Acres report indicates that freeboard is sufficient based on the fact that the upstream right streambank area was raised in the mid 1980's. However, a recent survey conducted as part of the 2008 Reconstruction Feasibility Study indicates the elevation of this area to be similar to that shown in the 1981 USACE report i.e. ± 711.5 NGVD. Thus, it would appear that inadequate freeboard currently exists.

Stantec**INSPECTION REPORT****HAMILTON DAM****CITY OF FLINT****GENESEE COUNTY, MICHIGAN****7.0 OPERATION AND MAINTENANCE**

The Hamilton Dam is operated and maintained by staff from the City of Flint Water Treatment Plant. Floodgates in Bays 1, 2 and 6 are currently non-functional. Floodgates in the remaining bays can be operated, however their reliability is diminished due to the deteriorated condition of the operating slab.

City staff maintains the impoundment elevation by operating the gates on an as needed basis. The impoundment is currently being maintained at the MDEQ mandated level of 705.25 NGVD i.e. 3.25 ft below normal.

The City has performed minimal maintenance to the structure in anticipation of reconstruction.

Appendix 8 - Cost of Service Study – Flint Water Treatment Plant

DRAFT

**Technical Memorandum
Cost of Service Study
Flint Water Treatment Plant**

I. Introduction

This Technical Memorandum describes the proposed improvements needed at the Flint Water Plant to treat Flint River water on a continuous basis. The primary foundations for this evaluation were the "Water Treatment Plant Rehabilitation – Phase II" report dated December 2003 and the "Preliminary Engineering Report, Lake Huron Water Supply, Karegnondi Water Authority" dated September 2009. The findings, as presented in the following sections, address the improvements required for the water plant to produce finished water in conformance with the current federal and state drinking water regulations. In addition, operation and maintenance costs for continuous operation have been evaluated and included in order to determine the total cost associated with using the Flint River as a source of water.

Improvements, as proposed in this evaluation, along with those previously made during the Phase I improvements program, will produce a finished water quality equal to the current water quality as received from the DWSD. The design parameters are as follows:

- 1) Minimum Day Demand – 10-mgd
Average Day Demand – 15-mgd (14-mgd in 2010 increasing to 15-mgd in 2050)
Maximum Day Demand – 28-mgd
- 2) Turbidity – 0.20 NTU
- 3) Hardness – 80 to 100 mg/l as CaCO_3
- 4) Cryptosporidium – 3-Log Inactivation
- 5) Giardia – >3-Log Inactivation
- 6) Viruses – >4-Log Inactivation
- 7) Taste and Odor – Eliminated with pre-ozonation
- 8) Trihalomethanes – Less than 80 $\mu\text{g/l}$
- 9) HAA5 – Less than 60 $\mu\text{g/l}$

As part of this investigation, an inspection of the Flint Water Plant was performed on May 3, 2011. The purpose of this inspection was to determine if the recommendations in the Phase II report, as referenced above, needed to be revised due to changed conditions or water supply needs. Based on findings from this meeting, the major adjustment to be made is the reduction of average day demand from 20-mgd to 14-mgd and maximum day demand being reduced from 36-mgd to 28-mgd. Required improvements as recommended in this study have taken these new demands into account. The conceptual design of these new facilities would allow cost effective expansion to 36-mgd, as needed, to meet future demands.

II. Required Capital Improvements

The following describes the required improvements as required for the Flint Water Plant to operate on a continual basis using the Flint River as a water source. Most of these improvements are more fully described in the Phase II report and are not repeated to avoid duplicative effort.

A. Lime Sludge Disposal

Lime sludge is proposed to be pumped from the east and west softening basins to two new 42-ft diameter thickeners (25-ft SWD) located adjacent to the plate settling building. Decant from the thickener will flow by gravity to the primary clarifier influent channel. Thickened sludge (12% solids) will be pumped to a new plate-and-frame filter press located at the north end of the WTP 1 primary settling basin. A new two-story building would be constructed at that location to house the pumping facilities and presses. Each press, located on the second floor, will have a 225-cf per hour capacity and will drop the dewatered sludge into a first floor bunker area. The dewatered cake will be transferred to a lime storage concrete bunker located approximately 60 feet north of the sludge press building. The storage bunker (100-ft x 192-ft) will have the capacity to store three to four months of dewatered lime sludge cake. About every three months, contract haulers will remove the lime sludge and place on agricultural lands that are permitted for final disposal.

The capacities of these facilities are based on average day flow of 15-mgd, maximum day demand of 28-mgd and water quality softening requirements. Based on raw water quality data provided by the City of Flint, a lime dosage of 209 mg/l, soda ash dosage of 47 mg/l and carbon dioxide dosage of 37 mg/l were used to estimate lime sludge quantities and flows.

Opinion of Probable Cost:

Site and Access:

Site Demolition	\$	129,000
Roadway Improvements	\$	385,000
Partial Settling Basin Demolition	\$	129,000
On-site Truck Scale	\$	257,000
Subtotal Construction:	\$	900,000
Construction Contingencies (15%):	\$	135,000
Design Contingencies (5%):	\$	45,000
Engineering, Legal, Bonds & Administration (17%):	\$	153,000

Opinion of Probable Cost: \$ 1,233,000

Thickener Basins - 42 ft Diameter:

Two Thickener Mechanisms	\$	310,000
Two Concrete Basins (25 ft SWD)	\$	513,000
Two Geodesic Dome Covers	\$	180,000
Install Equipment	\$	257,000
Site Work	\$	97,000
Utilities, Piping and Process	\$	193,000
Subtotal Construction:	\$	1,550,000
Construction Contingencies (15%):	\$	232,500
Design Contingencies (5%):	\$	77,500
Engineering, Legal, Bonds & Administration (17%):	\$	263,500

Opinion of Probable Cost: \$ 2,124,000

Filter Presses and Building:

Two-225 cf Plate & Frame Press	\$ 1,650,000
Building (70 ft x 60 ft)	\$ 3,331,000
MEP	\$ 1,089,000
Site Utilities	\$ 129,000
Subtotal Construction:	\$ 6,199,000
Construction Contingencies (15%):	\$ 929,850
Design Contingencies (5%):	\$ 309,950
Engineering, Legal, Bonds & Administration (17%):	\$ 1,053,830

Opinion of Probable Cost: \$ 8,493,000

Lime Storage Bunker and Site Work:

12 ft Concrete Walls and Slab	\$ 833,000
Frame and Fabric Building Cover	\$ 325,000
Site Improvements	\$ 385,000
Front End Loader (5 cyd)	\$ 308,000
Site Utilities	\$ 513,000
Subtotal Construction:	\$ 2,364,000
Construction Contingencies (15%):	\$ 354,600
Design Contingencies (5%):	\$ 118,200
Engineering, Legal, Bonds & Administration (17%):	\$ 401,880

Opinion of Probable Cost: \$ 3,239,000

Total for Lime Disposal : \$ 15,089,000

B. Soda Ash Feed System

In order to remove the non-carbonate hardness, soda ash will be needed to meet the finished water hardness concentrations. Two new 800 #/hour feeders will be needed to meet the dosage requirements. Each of these feeders will be connected to the existing silos.

Opinion of Probable Cost:

Demolition of Existing Feeders	\$ 20,000
Two 800 #/hr Feeders	\$ 112,000
MEP	\$ 109,000
Chemical	\$ 77,000
New Pneumatic Fill System	\$ 58,000
Subtotal Construction:	\$ 376,000
Construction Contingencies (15%):	\$ 56,400
Design Contingencies (5%):	\$ 18,800
Engineering, Legal, Bonds & Administration (17%):	\$ 63,920

Opinion of Probable Cost: \$ 516,000

C. Additional Chemical Storage

During the Phase I improvements, the MDEQ did not mandate 30-day chemical bulk storage requirements since the plant was a redundant water supply to the DWSD. However, if the facility becomes a continuously operated treatment plant, then additional chemical storage must be added to meet the minimum storage volume requirements. To comply with the regulations, new oxygen, nitrogen and carbon dioxide storage facilities must be provided as follows.

Liquid Carbon Dioxide:

Capacity – 34 tons

Vaporizer – 750 #/hour @ 300 psig

Piping – Schedule 80 Carbon Steel and Schedule 40 - 304L Stainless Steel

Liquid Oxygen

Capacity – 9000 gallons

Operating pressure – 75 psi

Feed Rate – 175 scfm

Piping – Type K Copper

Liquid Nitrogen

Capacity – 540 gallons

Operating pressure – 100 psi

Feed Rate – 1 scfm

Piping – Type K Copper

Opinion of Probable Cost:

Carbon Dioxide Storage Facilities	\$	328,000
MEP	\$	103,000
Oxygen & Nitrogen Storage Facilities	\$	961,000
MEP	\$	109,000
Subtotal Construction:		\$ 1,501,000
Construction Contingencies (15%):		\$ 225,150
Design Contingencies (5%):		\$ 75,050
Engineering, Legal, Bonds & Administration (17%):		\$ 255,170

Opinion of Probable Cost: \$ 2,057,000

D. Electrical and SCADA Improvements

Section 9, relating to power and controls, of the Phase II study was prepared by Dmytryka Jacobs Engineers (DJE). The scope of the Phase II work did not include detailed investigations of the water plant site-wide power distribution nor the secondary power distribution within each of the facility structures. However, a number of observations and basic recommendations were presented in Section 9 by DJE.

The Flint Water Plant currently uses 2400V as primary power throughout the facility. All of the power feeders in the plant site are 5kV rated and it appears the existing switchgear is also rated at 5kV. Most of the major electrical improvements installed during Phase I were dual voltage (2400/4160) equipment in anticipation of the plant power being changed to 4160V in the near future. This change would allow the existing network of power feeders to handle approximately twice the power and would eliminate running new feeders to various portions of the plant.

The current sub-station has two 2.5MVA transformers running in parallel for a total capacity 5 MVA. These old transformers are not equipped with cooling fans. The full connected load to these transformers is estimated to be 6.97 MVA while the estimated power load at 36 MGD is 4.22MVA. Based on these estimates there is sufficient power for the plant with both sub-station transformers in service. Even though the transformers are owned by Consumers Energy, it could take weeks to replace one of these main transformers in the event of a unit failure, which will result in reduced treatment and pumping capacity. The sub-station switchgear was installed in 1960 and is antiquated and difficult to maintain.

The two existing Fairbanks Morse generators are currently inoperable and would cost approximately \$1M to rehabilitate. The DJE team recommended installing two new emergency generators in lieu of rebuilding the existing units.

Section 9 of the Phase II report provides sufficient detail for the purposes of this report, but a detailed electric system evaluation of the entire plant should be performed prior to any major improvements to this facility.

While LAN did not perform a detailed review of the WTP electrical system during our site visit, it appears that all of the DJE findings are still pertinent. We, therefore, concur with the improvements as recommended by DJE in the Phase I report.

Opinion of Probable Cost:

Substation Upgrade	\$	961,000
Standby Power Generation	\$	2,242,000
Pump Station No. 4 Upgrade	\$	1,365,000
Filter Press Building Feeder	\$	87,000
WTP SCADA, Equipment & Programming	\$	720,000
Telemetry System Equipment & Programming	\$	103,000
Computers, Software & Training	\$	155,000
Filter Transfer PS Power Feeders	\$	135,000
Emergency PS Power Feeders	\$	145,000
Subtotal Construction:	\$	5,913,000
Construction Contingencies (15%):	\$	886,950
Design Contingencies (5%):	\$	295,650
Engineering, Legal, Bonds & Administration (17%):	\$	1,005,210
Opinion of Probable Cost:		\$ 8,101,000

E. Post-Chlorination and Zebra Mussel Control

The previous report recommended changing the disinfection system from gaseous chlorine to sodium hypochlorite due to the potential for hazardous gas release and the requirements imposed by new federal regulations. Previous treatability studies have not addressed the potential impact of re-growth in the system due to ozonation by-products. These impacts should be addressed prior to proceeding with final plans for using river water.

The Flint River is known to be infested with Zebra mussels and mitigation measures will have to be implemented if the plant is placed into continuous operation. A sodium permanganate feed system is proposed to address these concerns.

Opinion of Probable Cost:

Demolition of Existing Equipment	\$	39,000	
Storage Tanks	\$	9,000	
Metering Pumps and Tables	\$	11,000	
Piping, Valves & Tables	\$	9,000	
Containment	\$	59,000	
Installation	\$	108,000	
Subtotal Construction:	\$	235,000	
Construction Contingencies (15%):	\$	35,250	
Design Contingencies (5%):	\$	11,750	
Engineering, Legal, Bonds & Administration (17%):	\$	39,950	
Opinion of Probable Cost:		\$	322,000

F. Security Issues

For water plant security issues, please refer to City of Flint Vulnerability Assessment. Details are omitted in this report due to confidentiality.

Not available at the time of the previous report, a source water monitoring system is included in the study due to recent advancements in technology. The proposed system design is based on Hach Model SC1000, equipped with UVAS, NH4D, pH, ORP, turbidity and DO probes.

Opinion of Probable Cost:

Security Improvements	\$	145,000	
Source Water Monitoring System	\$	95,000	
Subtotal Construction:	\$	240,000	
Construction Contingencies (15%):	\$	36,000	
Design Contingencies (5%):	\$	12,000	
Engineering, Legal, Bonds & Administration (17%):	\$	40,800	
Opinion of Probable Cost:		\$	329,000

G. PS No. 4 - Low and High Service Pumps

Section 7 of the Phase II report included recommendations to replace two of the low lift pumps and two of the high lift pumps along with various other improvements. During the site visit, it was apparent the condition of this facility has continued to deteriorate. Furthermore, with the reduction in water system demands, the various pump capacities are no longer properly sized to efficiently meet the new plant flow ranges. The pumps and motors are oversized and are operating outside their best efficiency ranges and should be replaced due to age, condition and cost to operate.

Additionally, some of these pumps cannot be operated due to excessive vibrations in the shaft and steady bearings. Existing vibration monitors are functioning as designed and are shutting the power off to the motors to avoid damage.

For low lift service, it is proposed to install two 10-mgd and two 15-mgd (nominal ratings) vertically mounted pumps equipped with low voltage inverter duty motors. The motors would be powered by low

voltage variable frequency drives. This will provide a firm rated capacity of approximately 35-mgd in low lift capacity.

For high lift service, it is proposed to install one 10-mgd, two 15-mgd and one 20-mgd (nominal ratings) pumps equipped with medium voltage inverter duty motors. These motors will be powered by medium voltage variable frequency drives. This combination of pumps will provide a firm rated capacity of 40-mgd.

Opinion of Probable Cost:

Demolition of Existing Equipment	\$	135,000	
Install Two (2) 10 MGD @ 40 ft of TDH Vertically Mounted Pumps with 125 HP, 480 V Inverter Duty Motor with 20 ft of Shaft & Steady Bearings	\$	473,000	
Install Two (2) 15 MGD @ 40 ft of TDH Vertically Mounted Pumps with 150 HP, 480 V Inverter Duty Motor with 20 ft of Shaft & Steady Bearings	\$	495,000	
Install One (1) 10 MGD @ 190 ft of TDH Vertically Mounted Pump with 450 HP, 4160 V Inverter Duty Motor with 20 ft of Shaft & Steady Bearings	\$	245,000	
Install Two (2) 15 MGD @ 190 ft of TDH Vertically Mounted Pumps with 700 HP, 4160 V Inverter Duty Motor with 20 ft of Shaft & Steady Bearings	\$	520,000	
Install One (1) 20 MGD @ 190 ft of TDH Vertically Mounted Pump with 800 HP, 4160 V Inverter Duty Motor with 20 ft of Shaft & Steady Bearings	\$	285,000	
Piping, Valves, Supports & Bearings	\$	480,000	
Intermediate Platforms, Ladders & Stairs	\$	360,000	
Ventilation & Boiler Systems	\$	340,000	
Install Three (3) Low Voltage VFD Units	\$	85,000	
Install Four (4) Medium Voltage VFD Units	\$	2,250,000	
Subtotal Construction:	\$	5,668,000	
Construction Contingencies (15%):	\$	850,200	
Design Contingencies (5%):	\$	283,400	
Engineering, Legal, Bonds & Administration (17%):	\$	963,560	
Opinion of Probable Cost:	\$	7,766,000	

H. Filter Transfer Station to Dort Reservoir and UV Inactivation

Under the requirements as outlined in the USEPA drinking water regulations addressing potential microbial contaminants, additional treatment technologies and enhancement of existing processes must be implemented to comply with these regulations.

As required under the enhanced surface water treatment rules, it is essential for water utilities to address giardia, cryptosporidium, viruses and bacteria in finished water. The level of treatment is dependent on

the source water classification. The City of Flint will need to perform a two-year source water study to determine the bin placement for the Flint River. For the purposes of this report, a Bin 4 placement was selected due to the nature of the watershed and, therefore, it is assumed enhanced Ct and UV inactivation will be required.

Reservoir No. 3 does not provide sufficient Ct to meet the current regulations, therefore, Dort Reservoir will need to be placed into the process train. Since Dort Reservoir does not match the hydraulic profile of the plant, an intermediate pump station will be required. This new facility will also include a UV inactivation system to comply with the enhanced water quality regulations.

This proposed facility, located west of the filters and south of Dort Reservoir, will house three 14-mgd (nominal rating) variable speed pumps with inverter duty, low voltage motors for a firm rated capacity of 28-mgd. Housed in a separate part of this same structure will be the UV system that will be equipped with three 12" medium pressure units with a rated capacity of 28-mgd.

Opinion of Probable Cost:

Site Work & Utilities	\$	77,000
Building (80 ft x 60 ft)	\$	1,440,000
Three (3) 14 MGD @ 40 ft of TDH, Vertically Mounted Pumps with 150 HP, 480 V Inverter Duty Motor	\$	535,000
MEP	\$	940,000
Valves and Controls	\$	205,000
Install Three (3) 12" MP UV Units	\$	590,000
UV Piping & Controls	\$	368,000
Ventilation & Boiler Systems	\$	165,000
Install Three (3) Low Voltage VFD Units	\$	85,000
Piping Connections	\$	125,000
200 ft of 30" Water Main	\$	200,000
600 ft of 36" Water Main	\$	420,000
Subtotal Construction:	\$	5,150,000
Construction Contingencies (15%):	\$	772,500
Design Contingencies (5%):	\$	257,500
Engineering, Legal, Bonds & Administration (17%):	\$	875,500

Opinion of Probable Cost: \$ 7,056,000

I. Emergency Interconnect Pumping Station

The City of Flint and Genesee County DWWS have entered into an agreement to provide 8-mgd of back-up service to each other under emergency conditions. There are several alternatives for pumping station locations and configurations to accomplish this interconnect. For the purposes of this report, a station located west of the filter building was selected as the most practical from an operational cost perspective. While the opinions of cost presented below indicate that these pumps will be housed in their own structure, it is feasible to house the pumps in the filter transfer station for potential savings.

Preliminary design for this pumping station include two constant speed 8-mgd pumps equipped with soft starts and medium voltage motors. A reverse flow control station will be included within the same structure to allow for flow from the DWWS to assist the City of Flint. Approximately three miles of 24-inch pipeline will be needed to connect the two systems.

Opinion of Probable Cost:

Site Work & Utilities	\$	90,000	
Building (32 ft x 24 ft)	\$	245,000	
Install Two (2) 8 MGD @ 290 ft of TDH, Vertically Mounted Pumps with 600 HP, 4160V Motor	\$	380,000	
MEP	\$	335,000	
Valves and Controls	\$	128,000	
Reverse Flow Control Station	\$	110,000	
Ventilation Systems	\$	35,000	
16000 ft of 24" Water Main	\$	4,992,000	
Subtotal Construction:	\$	6,315,000	
Construction Contingencies (15%):	\$	947,250	
Design Contingencies (5%):	\$	315,750	
Engineering, Legal, Bonds & Administration (17%):	\$	1,073,550	
Opinion of Probable Cost:	\$	8,652,000	

The opinions of capital cost presented in the preceding sections are tied to an ENR Index of 8688 to match the September 2009 Lake Huron Water Supply Report. Furthermore, the contingency percentages included with each opinion of cost are the same as in the September 2009 report. The total opinion of probable project cost of these proposed improvements is as follows:

Lime Sludge Disposal	\$	15,089,000
Soda Ash Feed System	\$	516,000
Additional Chemical Storage	\$	2,057,000
Electrical and SCADA Improvements	\$	8,101,000
Post-Chlorination and Zebra Mussel Control	\$	322,000
Security Issues	\$	329,000
PS No. 4 - Low & High Service Pumps	\$	7,766,000
Filter Transfer Pumping Station & UV	\$	7,056,000
Emergency Interconnect Pumping Station	\$	8,652,000
Total Opinion of Probable Project Cost:	\$	49,888,000

III. Cost of Additional Operation

The City of Flint currently operates the water treatment plant periodically during the year to maintain the systems and to meet regulatory requirements. The water treatment plant is staffed with various classifications of employees to operate and maintain the facility for these minimal operations.

As part of this work, and to develop all costs of providing water service from the Flint River, it is necessary to determine the probable cost for operating and maintaining this facility for continuous operation. Water quality differences between the Flint River and Lake Huron are significant and require different treatment chemicals and dosages. Most noticeable is the fact that Lake Huron water does not require softening which negates the need for softening process and the associated lime sludge disposal.

The primary cost parameters that are included in this difference are labor, chemicals, residual disposal and electrical power. Each will be discussed in the following sections. These costs were projected through the year 2050.

A. Labor

Additional staffing was discussed and developed with representatives from the City of Flint to provide full time coverage on a 24/7/365 schedule, plus provide staff for residual management and operations of the various dams. Hourly rates and fringe benefits were based on current budget figures and inflated at a rate of 3% for future costs. The following table outlines the proposed staffing a cost for this operational element.

Classification	Number	Cost/Hr	Hrs/Year	Total	Fringe (%)	Total
Operators	12	\$ 20.00	2080	\$ 499,200	90.40%	\$ 950,477
Maintenance	4	\$ 25.00	2080	\$ 208,000	90.40%	\$ 396,032
Laboratory QA/QC	2	\$ 24.00	2080	\$ 99,840	90.40%	\$ 190,095
Laboratory SDWA	2	\$ 20.00	2080	\$ 83,200	90.40%	\$ 158,413
Planned Overtime	NA	MIXED	8320	\$ 178,048	90.40%	\$ 339,003

This estimate represents approximately \$2,034,000 per year of additional labor.

B. Chemicals

Chemical costs are based on the projected average day water demand of 14-mgd and the average dose for each of the chemicals based on the raw water quality information and other operational records. Further, data from the previous treatability work performed during the Phase I improvements was also incorporated into these estimates. Chemical suppliers and other water utilities were contacted to obtain current chemical purchase costs which were adjusted by the ENR ratio back to an index of 8688. Where necessary, transportation costs to the Flint, MI area were included. The following summarizes the chemical costs associated with treating the Flint River water.

Chemical	Dose(mg/l)	Cost/#	Cost/ MGD
Ferric	44.50	\$0.24	\$89.07
Lime	209.00	\$0.10	\$174.31
Soda Ash	47.00	\$0.29	\$113.67
CO ₂	37.00	\$0.10	\$30.86
Cl ₂	3.00	\$0.34	\$8.51
Fluoride	1.00	\$0.33	\$2.75
Phosphate*	1.00	\$0.51	\$4.25
		Cost per MGD	\$423.42

*Costs range from \$0.51 to \$0.96 per pound

In addition to the above, the cost of ozone will need to be added which is approximately \$20.08 per million gallons per day per mg/l dose. This cost includes oxygen, nitrogen and power costs.

C. Residual Disposal

This category is divided into two groups: clarifier sludge collected in the plate settling basins and lime sludge from the softening process. The clarifier sludge is pumped from the clarifier basins by zone (six zones per train, three trains, total of 18 zones) to the plant main drain. As part of the Phase I work, the main drain was connected to a new wastewater pumping station located south of the filter gallery building. This pump station discharges the collected residuals to the city's sanitary sewer system. Nearly all of the filter wash water is recirculated back to the head of the ozone facility for re-use.

The cost to treat clarified sludge discharged into the sanitary sewer system is calculated as follows:

Plate Clarifier Sludge

Flow (MGD)	14
SS (mg/l)	75
Primary Sludge (#/d)	13,435
% Solids	2%
Sludge (gals/day)	80,500
Sludge (cf/day)	10,762

Based on the City of Flint's current wastewater charges of \$1.00 per 100 cf, the annual cost would be \$39,200 per year.

Lime/Soda Ash softening generates large quantities of residual wastes that have high disposal costs. The treatment proposed in this study involves pumping the sludge, at about 4% concentration, from the softening basins to two gravity thickeners, where it will concentrate to about 12% solids. After thickening, sludge will be pumped to the filter presses to be dewatered to approximately 55% solids. The filter presses will drop the cake into a lower bunker where it will be removed by an end loader to the main storage bunker. About every three months, the sludge will be loaded onto trucks and applied to agricultural land.

The volume of sludge is estimated as follows:

Sludge Production from Clarifier

Reaction	meq/l	meq/l as CaCO_3	meq/l as Mg(OH)_2
CO_2	0.25	0.25	0
$\text{Ca(HCO}_3)_2$	4.65	9.30	0
$\text{Mg(HCO}_3)_2$	0.30	0.60	0.30
MgSO_4	0.89	0.89	0.89
Excess Lime	1.25	1.25	0
Total meq/l		12.28	1.19
Less Practical Limits meq/l		0.60	0.20
Precipitate Produced meq/l		11.68	0.99
Precipitate Produced mg/l		584	49
Precipitate Produced #/MG		4872	412
Total #/MG		5284	
WTP Flow (MGD)	14	27	
Dry Sludge Production in #/day		73,983	142,681
@ 4% Solids (gals/day)		221,771	427,701
@ 12% Solids (gals/day)		73,924	142,567
@ 12% Solids (gals/week)		517,466	997,970
Dry Sludge Production (tons/week)	259		SG CaCO_3 2.71
Number of Hours per Week to Press	48		SG Mg(OH)_2 2.36
Dry Sludge Processed (#/hr)	10,789		SG solids 2.68
@ 55% Solids Sludge Processed (#/hr)	19,617		
55% Solids Sludge (#/cy)	2571	Sludge Solids =	55% as CaCO_3
@ 55% Solids Sludge Processed (cf/hr)	206	Sludge Unit Wt. =	95.22 pcf

Based on the preceding, 471 tons of softening sludge at 55% solids will be handled each week based on average flow and chemical dosage. Several Michigan water facilities were contacted to obtain lime sludge hauling and disposal costs. From this data a rate of \$18.50 per wet ton was selected as a reasonable rate for disposal cost. This rate will result in an annual cost of \$453,000.

D. Power

Practically all of the additional power costs are associated with low lift, intermediate transfer and high service pumping. Additional power costs will be used for process and handling of the softening sludge. The City of Flint is currently paying \$0.07 per kwhr for service at the water plant. Power costs are calculated as follows:

TDH (ft) - High	190
TDH (ft) - Filter Transfer	40
TDH (ft) - Low	40
TDH Total (ft)	270
Pump Eff. (W to W)	80.00%
\$/kwhr	\$0.070
Pumping Cost Per MGD	\$99.51
Solids Handling per MGD	\$4.98
Total Power Cost per MGD	\$104.49

Annual costs associated with the operation and maintenance of the Flint Water Plant are summarized in the attached tables following this section.

IV. Project Implementation Schedule

There are a number of issues that will impact the implementation schedule for this work. The source water studies to define bin number associated with cryptosporidium and giardia will take approximately two years. Part of these studies can be performed concurrently with design, but sufficient work will need to be performed to avoid impacting design schedule or work. A planning period of one year should be allowed for preliminary water quality and regulatory evaluations prior to initiating design work. Design of this project will require 10 to 12 months, with an additional three months required for permitting. After permits are received, allow three months for bidding and contract execution. Major equipment procurement and construction will take from 24 to 30 months. Plant commissioning will take about 2 months.

Total time required from notice to proceed to project completion 52 months to 60 months. This time frame does not include financing issues.

City of Flint
Enforcement



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

LF82710

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: PLANT TAP
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 09/14/2015 07:35
Date Received: 09/15/2015 11:49
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

EDB and DBCP by GC

1,2 Dibromo-3-chloropropane	Not Detected	09/23/2015	0.00002	0.0002	EPA 504.1	96-12-8
1,2 Dibromoethane	Not Detected	09/23/2015	0.00001	0.00005	EPA 504.1	106-93-4

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

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

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

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

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



**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
LF82711

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	09/14/2015 07:50
Sample Point:	PS4 3 MG WELL	Date Received:	09/15/2015 11:49
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	1.52	09/16/2015	0.5		SM 5310C	TOC-00-C

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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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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
LF82712

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: RAW WATER
Water System: Public System Surface Water

WSSN/Pool ID: 2310
Source: Surface Water
Site Code:
Collector: Public Water Supply Operator
Date Collected: 09/14/2015 07:40
Date Received: 09/15/2015 11:49
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	8.20	09/16/2015	0.5		SM 5310C	TOC-00-C

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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 Knsztian

**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
LF81255

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:	3216 M L KING BLVD, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	DBP 6
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	09/01/2015 11:53
Sample Point:	BATH	Date Received:	09/03/2015 11:05
Water System:	Treated Public Distribution System	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Volatile Organic Compounds

1,1 Dichloroethane	Not Detected	09/03/2015	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	09/03/2015	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	09/03/2015	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	09/03/2015	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	09/03/2015	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	09/03/2015	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	09/03/2015	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	09/03/2015	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	09/03/2015	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	09/03/2015	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	09/03/2015	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	09/03/2015	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	09/03/2015	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	09/03/2015	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	09/03/2015	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	09/03/2015	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	09/03/2015	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	09/03/2015	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichloropropane	Not Detected	09/03/2015	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	09/03/2015	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	09/03/2015	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	09/03/2015	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.019	09/03/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0045	09/03/2015	0.0005	0.080	EPA 524.2	75-25-2

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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 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**LF81255**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Bromomethane	Not Detected	09/03/2015	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	09/03/2015	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	09/03/2015	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.020	09/03/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	09/03/2015	0.0005		EPA 524.2	75-00-3
Chloroform	0.013	09/03/2015	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	09/03/2015	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	09/03/2015	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	09/03/2015	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	09/03/2015	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	09/03/2015	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	09/03/2015	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	09/03/2015	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	09/03/2015	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	09/03/2015	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	09/03/2015	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	09/03/2015	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	09/03/2015	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	09/03/2015	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	09/03/2015	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	09/03/2015	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	09/03/2015	0.0005		EPA 524.2	104-51-8
n-Propylbenzene	Not Detected	09/03/2015	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	09/03/2015	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	09/03/2015	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	09/03/2015	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	09/03/2015	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	09/03/2015	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	09/03/2015	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	09/03/2015	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	09/03/2015	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	09/03/2015	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	09/03/2015	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.057	09/03/2015	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	09/03/2015	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	09/03/2015	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	09/03/2015	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	09/03/2015	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	09/03/2015	0.0005	0.002	EPA 524.2	75-01-4

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**



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P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number
LF81255

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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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)
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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
LF80732

Official Laboratory Report

Report To: VILLAGE OF FOWLER
225 N MAIN
PO BOX 197
FOWLER MI 48835

System Name/Owner:	VILLAGE OF FOWLER	WSSN/Pool ID:	2390
Collection Address:	1915 N WRIGHT RD, FOWLER	Source:	TYPE I
Collected By:	VERN	Site Code:	
Township/Well#/Section:	DALLAS//11	Collector:	Public Water Supply Operator
County:	Clinton	Date Collected:	09/01/2015 08:00
Sample Point:	PLANT TAP POST FILTER	Date Received:	09/01/2015 13:08
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 #
Arsenic	0.003	09/02/2015	0.002	0.010	EPA 200.8	7440-38-2

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Mid-Michigan District Health Dept.
1307 E Townsend
St. Johns, MI 48879
989 224-2195

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
LF78957

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:	3606 CORUNNA RD, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	DBP4 5
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/18/2015 13:15
Sample Point:	BATHROOM	Date Received:	08/20/2015 11:50
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/22/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.007	08/22/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/22/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/22/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.005	08/22/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	08/22/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.013	08/22/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	08/22/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.022	08/22/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0049	08/22/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.023	08/22/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.012	08/22/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0619	08/22/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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mg/L : milligrams / Liter (ppm)
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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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DRINKING WATER LABORATORY**



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

**Sample Number
LF78953**

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 6204 N SAGINAW ST, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: DBP8 3
Collector: Public Water Supply Operator
Date Collected: 08/18/2015 12:43
Date Received: 08/20/2015 11:50
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/22/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.006	08/22/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/22/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/22/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	08/22/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	08/22/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.010	08/22/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	08/22/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.015	08/22/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0035	08/22/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.016	08/22/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0081	08/22/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0426	08/22/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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



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

**Sample Number
LF78954**

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:	5018 CLIO RD, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	DBP7 <i>le</i>
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/18/2015 12:23
Sample Point:	BATHROOM	Date Received:	08/20/2015 11:50
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 #
Dalapon and Haloacetic						
Bromoacetic acid	0.001	08/25/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.008	08/25/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/25/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/25/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.005	08/25/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	08/25/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.015	08/25/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	08/25/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.021	08/22/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0045	08/22/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.021	08/22/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.013	08/22/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0595	08/22/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



Sample Number
LF78955

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:	3216 M L KING BLVD, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	DBP6
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/18/2015 12:03
Sample Point:	BATHROOM	Date Received:	08/20/2015 11:50
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/22/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	Not Detected	08/22/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/22/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/22/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	08/22/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	Not Detected	08/22/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.002	08/22/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	08/22/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.029	08/22/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0063	08/22/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.024	08/22/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.031	08/22/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0903	08/22/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



Sample Number
LF78956

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:	2501 FLUSHING RD, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	DBP5 4
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/18/2015 11:35
Sample Point:	UTILITY SINK	Date Received:	08/20/2015 11:50
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 #
Dalapon and Haloacetic						
Bromoacetic acid	0.001	08/25/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.007	08/25/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/25/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/25/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.005	08/25/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	08/25/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.013	08/25/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	08/25/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.025	08/22/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0056	08/22/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.025	08/22/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.015	08/22/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0706	08/22/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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



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

Sample Number
LF78958

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:	3302 S DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENFIELD	Site Code:	DBP3
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/18/2015 10:36
Sample Point:	KITCHEN	Date Received:	08/20/2015 11:50
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/22/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.008	08/22/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/22/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/22/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.005	08/22/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	08/22/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.014	08/22/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	08/22/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.019	08/22/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0042	08/22/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.020	08/22/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.010	08/22/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0532	08/22/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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



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

Sample Number
LF78960

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:	3719 DAVISON RD, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	DBP1
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/18/2015 10:17
Sample Point:	KITCHEN	Date Received:	08/20/2015 11:50
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.008	08/23/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/23/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/23/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.005	08/23/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	08/23/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.015	08/23/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.004	08/23/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.027	08/22/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0055	08/22/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.026	08/22/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.017	08/22/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0755	08/22/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



Sample Number

LF78959

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 822 S DORT HWY, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: DBP2
Collector: Public Water Supply Operator
Date Collected: 08/18/2015 09:59
Date Received: 08/20/2015 11:50
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.006	08/23/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/23/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/23/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	08/23/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	08/23/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.011	08/23/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	08/23/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.020	08/22/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0039	08/22/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.019	08/22/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.012	08/22/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0549	08/22/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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



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

Sample Number
LF78961

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHERD	Site Code:	3 MG WELL
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/18/2015 07:58
Sample Point:	PS4	Date Received:	08/20/2015 11:50
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	1.13	08/21/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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



USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LF78962

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: RAW
Water System: Public System Surface Water

WSSN/Pool ID: 2310
Source: Surface Water
Site Code: RAW WATER INTAKE
Collector: Public Water Supply Operator
Date Collected: 08/18/2015 07:50
Date Received: 08/20/2015 11:50
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	8.60	08/21/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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

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



Sample Number
LF77582

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: C BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: PLANT TAP
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 08/11/2015 10:00
Date Received: 08/12/2015 13:21
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	08/13/2015	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	08/13/2015	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.02	08/13/2015	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	08/13/2015	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	08/13/2015	0.0003	0.005	EPA 200.8	7440-43-9
Chloride	79	08/12/2015	4		SM 4500-Cl E	7647-14-5
Chromium	Not detected	08/13/2015	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	08/14/2015	0.02	0.2	OIA-1677	57-12-5
Fluoride	0.83	08/12/2015	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO ₃	110	08/12/2015	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	08/12/2015	0.1		SM 3500 FeB	7439-89-6
Lead	Not detected	08/13/2015	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	08/13/2015	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	08/13/2015	0.01	0.1	EPA 200.8	7440-02-0
Nitrate as N	Not Detected	08/12/2015	0.4	10	10-107-04-2-B	14797-55-8
Nitrite as N	Not detected	08/12/2015	0.05	1	10-107-04-2-B	14797-65-0
Matrix spike recovery was below the acceptance criteria due to the presence of residual chlorine in the sample. This does not affect the validity of the sample result.						
Selenium	Not detected	08/13/2015	0.001	0.05	EPA 200.8	7782-49-2
Sodium (automated)	18	08/12/2015	5		SM 3500 NaB	7440-23-5
Sulfate	21	08/12/2015	10		SM 4500 SO ₄ E	14808-79-8
Thallium	Not detected	08/13/2015	0.0002	0.002	EPA 200.8	7440-28-0

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RL : Reporting Limit

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

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

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

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Sample Number**LF77582**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Carbamates by HPLC						
3 Hydroxycarbofuran	Not Detected	08/14/2015	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	08/14/2015	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	08/14/2015	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	08/14/2015	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	08/14/2015	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	08/14/2015	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	08/14/2015	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	08/14/2015	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	08/14/2015	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	08/14/2015	0.001		EPA 531.2	114-26-1
Chlorinated Acid Herbicides						
2,4,5-T	Not Detected	08/18/2015	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	08/18/2015	0.0002	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	08/18/2015	0.001	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	08/18/2015	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	08/18/2015	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	08/18/2015	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	08/18/2015	0.0002	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	08/18/2015	0.00004	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	08/18/2015	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	08/18/2015	0.001		EPA 515.4	1861-32-1
Pesticides Analysis by GC/MS						
4,4'-DDD	Not Detected	08/18/2015	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	08/18/2015	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	08/18/2015	0.0005		EPA 525.2	50-29-3
Acetochlor	Not Detected	08/18/2015	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	08/18/2015	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	08/18/2015	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	08/18/2015	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	Not Detected	08/18/2015	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	08/18/2015	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	08/18/2015	0.0001	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	08/18/2015	0.001		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	08/18/2015	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	08/18/2015	0.0002	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	08/18/2015	0.0001	0.0002	EPA 525.2	1024-57-3

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ppm : parts per million

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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

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Sample Number
LF77582



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Pesticides Analysis by GC/MS						
Hexachlorobenzene	Not Detected	08/18/2015	0.0001	0.001	EPA 525.2	118-74-1
Hexachlorocyclohexane (alpha-BHC)	Not Detected	08/18/2015	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	08/18/2015	0.001		EPA 525.2	319-85-7
Hexachlorocyclohexane (delta-BHC)	Not Detected	08/18/2015	0.001		EPA 525.2	319-86-8
Hexachlorocyclopentadiene	Not Detected	08/18/2015	0.0005	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	08/18/2015	0.0001	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	08/18/2015	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	08/18/2015	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	08/18/2015	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	08/18/2015	0.0005		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	08/18/2015	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1221)	Not Detected	08/18/2015	0.0001	0.0005	EPA 525.2	11104-28-2
PCB (aroclor 1232)	Not Detected	08/18/2015	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	08/18/2015	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	08/18/2015	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	08/18/2015	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	08/18/2015	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	08/18/2015	0.0001		EPA 525.2	59536-65-1
Simazine	Not Detected	08/18/2015	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	08/18/2015	0.001	0.003	EPA 525.2	8001-35-2
Volatile Organic Compounds						
1,1 Dichloroethane	Not Detected	08/14/2015	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	08/14/2015	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	08/14/2015	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	08/14/2015	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	08/14/2015	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	08/14/2015	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	08/14/2015	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	08/14/2015	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	08/14/2015	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	08/14/2015	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	08/14/2015	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	08/14/2015	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	08/14/2015	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	08/14/2015	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	08/14/2015	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	08/14/2015	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	08/14/2015	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	08/14/2015	0.0005	0.075	EPA 524.2	106-46-7

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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

LF77582



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
2,2 Dichloropropane	Not Detected	08/14/2015	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	08/14/2015	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	08/14/2015	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	08/14/2015	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.0036	08/14/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0013	08/14/2015	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	08/14/2015	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	08/14/2015	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	08/14/2015	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.0052	08/14/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	08/14/2015	0.0005		EPA 524.2	75-00-3
Chloroform	0.0015	08/14/2015	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	08/14/2015	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	08/14/2015	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	08/14/2015	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	08/14/2015	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	08/14/2015	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	08/14/2015	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	08/14/2015	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	08/14/2015	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	08/14/2015	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	08/14/2015	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	08/14/2015	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	08/14/2015	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	08/14/2015	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	08/14/2015	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	08/14/2015	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	08/14/2015	0.0005		EPA 524.2	104-51-8
n-Propylbenzene	Not Detected	08/14/2015	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	08/14/2015	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	08/14/2015	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	08/14/2015	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	08/14/2015	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	08/14/2015	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	08/14/2015	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	08/14/2015	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	08/14/2015	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	08/14/2015	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	08/14/2015	0.0005	1	EPA 524.2	108-88-3

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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

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Sample Number

LF77582



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Total Trihalomethanes	0.012	08/14/2015	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	08/14/2015	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	08/14/2015	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	08/14/2015	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	08/14/2015	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	08/14/2015	0.0005	0.002	EPA 524.2	75-01-4

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

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

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

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Laboratory Contacts
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Systems Mgmt. Unit Mgr: George Krisztian

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



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Sample Number
LF74073

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: RAW WATER INTAKE
Water System: Public System Surface Water

WSSN/Pool ID: 2310
Source: Surface Water
Site Code:
Collector: Other
Date Collected: 07/22/2015 07:50
Date Received: 07/23/2015 11:10
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	8.84	07/29/2015	0.5		SM 5310C	TOC-00-C

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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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**Sample Number
LF74074**

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: PS4 3MG WELL
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 07/22/2015 07:58
Date Received: 07/23/2015 11:10
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	3.55	07/29/2015	0.5		SM 5310C	TOC-00-C

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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

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



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P.O. Box 30270
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FAX: (517) 335-8562

Sample Number
LF72036

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: PS4 - 3MG WELL
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Other
Date Collected: 07/06/2015 08:15
Date Received: 07/10/2015 10:36
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Volatile Organic Compounds

1,1 Dichloroethane	Not Detected	07/11/2015	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	07/11/2015	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	07/11/2015	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	07/11/2015	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	07/11/2015	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	07/11/2015	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	07/11/2015	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	07/11/2015	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	07/11/2015	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	07/11/2015	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	07/11/2015	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	07/11/2015	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	07/11/2015	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	07/11/2015	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	07/11/2015	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	07/11/2015	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	07/11/2015	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	07/11/2015	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichloropropane	Not Detected	07/11/2015	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	07/11/2015	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	07/11/2015	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	07/11/2015	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.028	07/11/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0032	07/11/2015	0.0005	0.080	EPA 524.2	75-25-2

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. M100003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF72036



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Bromomethane	Not Detected	07/11/2015	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	07/11/2015	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	07/11/2015	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.018	07/11/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	07/11/2015	0.0005		EPA 524.2	75-00-3
Chloroform	0.030	07/11/2015	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	07/11/2015	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	07/11/2015	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	07/11/2015	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	07/11/2015	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	07/11/2015	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	07/11/2015	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	07/11/2015	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	07/11/2015	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	07/11/2015	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	07/11/2015	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	07/11/2015	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	07/11/2015	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	07/11/2015	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	07/11/2015	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	07/11/2015	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	07/11/2015	0.0005		EPA 524.2	104-51-8
n-Propylbenzene	Not Detected	07/11/2015	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	07/11/2015	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	07/11/2015	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	07/11/2015	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	07/11/2015	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	07/11/2015	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	07/11/2015	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	07/11/2015	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	07/11/2015	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	07/11/2015	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	07/11/2015	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.079	07/11/2015	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	07/11/2015	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	07/11/2015	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	07/11/2015	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	07/11/2015	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	07/11/2015	0.0005	0.002	EPA 524.2	75-01-4

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

LF72036

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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

**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

**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 A. H. Levanseler

Kerri Levanseler - Director, Chemistry Laboratory

Date 26-JUN-2015

**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
LF69110

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: CHRIS BERIENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: PS4 -3MG WELL
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 06/22/2015 08:30
Date Received: 06/23/2015 11:35
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	2.52	06/23/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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



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

Sample Number
LF69111

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: RAW WATER INTAKE
Water System: Public System Surface Water

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 06/22/2015 08:25
Date Received: 06/23/2015 11:35
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	8.59	06/23/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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



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

Sample Number
LF68035

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: PS4 3MG WELL
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 06/15/2015 07:56
Date Received: 06/16/2015 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 #
Total Organic Carbon	0.79	06/17/2015	0.5		SM 5310C	TOC-00-C

Quality control results were outside allowed limits due to matrix interferences.

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
LF68036

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:	4500 N DORT HWY, FLINT	Source:	Surface Water
Collected By:	CHRIS BEATENHEAD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	06/15/2015 07:50
Sample Point:	RAW WATER INTAKE	Date Received:	06/16/2015 11:34
Water System:	Public System Surface Water	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	2.83	06/17/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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



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NSF International789 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 48502DEQ
RESOURCE MANAGEMENT DIVISION

JUN 12 2015

LANSING DISTRICT

Facility: C0211290City of Flint Water Plant
4500 North Dort Highway
Flint MI 48505
United States**Result COMPLETE****Report Date 08-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-00176235
Project Number	10005233 (CL17)
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 AuthorizationKerri Levanseler**Date 08-JUN-2015**

Kerri Levanseler - Director, Chemistry Laboratory

**General Information**

Standard: USFDA CFR Title 21 Part 165.110
Date and Time Sampled: 05/26/2015 07:45 EDT
Product Description: Municipal Water
Test Description: Bromate - May 2015 - Additional

Sample Id: S-0001160148
Description: Municipal Water - 05/26/2015 07:45 EDT
Sampled Date: 05/26/2015
Received Date: 05/29/2015

Testing Parameter	Reporting Limit	Result	FDA SOQ	Units	P / F
Disinfection Residuals/Disinfection By-Products					
Bromate	5	ND	10	ug/L	Pass

**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
LF66231

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	06/02/2015 14:00
Sample Point:	PLANT TAP	Date Received:	06/04/2015 11:06
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	06/05/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.005	06/05/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	06/05/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	06/05/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	06/05/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.007	06/05/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.013	06/05/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	06/05/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.014	06/05/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0027	06/05/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.012	06/05/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.010	06/05/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0387	06/05/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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

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



Sample Number
LF64064

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 6204 N SAGINAW ST, FLINT
Collected By: CHRIS BEATENHERD
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: DBP 8
Collector: Public Water Supply Operator
Date Collected: 05/18/2015 12:52
Date Received: 05/19/2015 13:07
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	0.001	05/20/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.007	05/20/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/20/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/20/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.010	05/20/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.017	05/20/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.017	05/19/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0022	05/19/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.012	05/19/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.014	05/19/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0452	05/19/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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

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



Sample Number
LF64065

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:	5018 CLIO RD, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHERD	Site Code:	DBP 7
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/18/2015 12:34
Sample Point:	BATHROOM	Date Received:	05/19/2015 13:07
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 #
Dalapon and Haloacetic						
Bromoacetic acid	0.001	05/20/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.007	05/20/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.002	05/20/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/20/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	05/20/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.011	05/20/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.022	05/20/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.004	05/20/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.022	05/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0025	05/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.015	05/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.021	05/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0605	05/20/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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

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



Sample Number
LF64072

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: PS4
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 05/18/2015 12:34
Date Received: 05/19/2015 13:07
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	2.54	05/21/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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

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



Sample Number
LF64071

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:	4500 N DORT HWY, FLINT	Source:	Single Family Dwelling
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/18/2015 12:30
Sample Point:	RAW WATER INTAKE	Date Received:	05/19/2015 13:07
Water System:	Public System Surface Water	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	7.89	05/21/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF64068



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:	3216 MLK BLVD, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	DBP 6 7
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/18/2015 12:15
Sample Point:	BATHROOM	Date Received:	05/19/2015 13:07
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/20/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	05/20/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/20/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/20/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	05/20/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.010	05/20/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	05/20/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.026	05/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0027	05/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.017	05/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.027	05/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0727	05/20/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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

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



Sample Number
LF64073

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 2501 FLUSHING RD, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: UTILITY ROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: DBP 5
Collector: Public Water Supply Operator
Date Collected: 05/18/2015 11:57
Date Received: 05/19/2015 13:13
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	0.001	05/20/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.005	05/20/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/20/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/20/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.008	05/20/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.015	05/20/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.022	05/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0028	05/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.016	05/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.019	05/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0598	05/20/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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

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



Sample Number
LF64067

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:	3606 CORUNNA RD, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	DBP 4
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/18/2015 11:41
Sample Point:	BATHROOM	Date Received:	05/19/2015 13:07
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 #
Dalapon and Haloacetic						
Bromoacetic acid	0.001	05/20/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.006	05/20/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/20/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/20/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.009	05/20/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.016	05/20/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.021	05/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0027	05/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.015	05/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.016	05/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0547	05/20/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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

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



Sample Number
LF64066

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:	3302 S DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	DBP 3 <i>2</i>
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/18/2015 11:16
Sample Point:	UTILITY ROOM	Date Received:	05/19/2015 13:07
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 #
Dalapon and Haloacetic						
Bromoacetic acid	0.001	05/20/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.006	05/20/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/20/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/20/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.010	05/20/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.017	05/20/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.020	05/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0025	05/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.015	05/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.026	05/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0635	05/20/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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



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

Sample Number
LF64069

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:	822 S DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	DBP 2
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/18/2015 11:00
Sample Point:	UTILITY ROOM	Date Received:	05/19/2015 13:07
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 #
Dalapon and Haloacetic						
Bromoacetic acid	0.001	05/20/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.006	05/20/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/20/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/20/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.009	05/20/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.016	05/20/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.017	05/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0021	05/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.013	05/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.014	05/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0461	05/20/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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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
LF64070

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:	3719 DAVISON RD, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	DBP 1
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/18/2015 10:39
Sample Point:	BATHROOM	Date Received:	05/19/2015 13:07
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 #
Dalapon and Haloacetic						
Bromoacetic acid	0.001	05/20/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.006	05/20/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/20/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/20/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.009	05/20/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.016	05/20/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	05/20/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.019	05/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0024	05/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.014	05/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.016	05/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0514	05/20/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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Sample Number
LF63412

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: PLANT TAP
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 05/12/2015 11:33
Date Received: 05/13/2015 11:26
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	05/14/2015	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	05/14/2015	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.03	05/14/2015	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	05/14/2015	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	05/14/2015	0.0003	0.005	EPA 200.8	7440-43-9
Chloride	90	05/13/2015	4		SM 4500-Cl E	7647-14-5
Chromium	Not detected	05/14/2015	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	05/14/2015	0.02	0.2	OIA-1677	57-12-5
Fluoride	0.87	05/13/2015	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	163	05/13/2015	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	05/13/2015	0.1		SM 3500 FeB	7439-89-6
Lead	Not detected	05/14/2015	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not Detected	05/14/2015	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	05/14/2015	0.01	0.1	EPA 200.8	7440-02-0
Nitrate as N	Not Detected	05/13/2015	0.4	10	10-107-04-2-B	14797-55-8
Nitrite as N	Not detected	05/13/2015	0.05	1	10-107-04-2-B	14797-65-0
Selenium	Not Detected	05/14/2015	0.001	0.05	EPA 200.8	7782-49-2
Sodium (automated)	18	05/13/2015	5		SM 3500 NaB	7440-23-5
Sulfate	31	05/13/2015	10		SM 4500 SO4E	14808-79-8
Thallium	Not detected	05/14/2015	0.0002	0.002	EPA 200.8	7440-28-0

Carbamates by HPLC

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Sample Number

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TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Carbamates by HPLC						
3 Hydroxycarbofuran	Not Detected	05/18/2015	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	05/18/2015	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	05/18/2015	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	05/18/2015	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	05/18/2015	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	05/18/2015	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	05/18/2015	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	05/18/2015	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	05/18/2015	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	05/18/2015	0.001		EPA 531.2	114-26-1
Chlorinated Acid Herbicides						
2,4,5-T	Not Detected	05/18/2015	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	05/18/2015	0.0002	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	05/18/2015	0.001	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	05/18/2015	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	05/18/2015	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	05/18/2015	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	05/18/2015	0.0002	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	05/18/2015	0.00004	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	05/18/2015	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	05/18/2015	0.001		EPA 515.4	1861-32-1
Pesticides Analysis by GC/MS						
4,4'-DDD	Not Detected	05/18/2015	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	05/18/2015	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	05/18/2015	0.0005		EPA 525.2	50-29-3
Acetochlor	Not Detected	05/18/2015	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	05/18/2015	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	05/18/2015	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	05/18/2015	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	Not Detected	05/18/2015	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	05/18/2015	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	05/18/2015	0.0001	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	05/18/2015	0.001		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	05/18/2015	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	05/18/2015	0.0002	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	05/18/2015	0.0001	0.0002	EPA 525.2	1024-57-3
Hexachlorobenzene	Not Detected	05/18/2015	0.0001	0.001	EPA 525.2	118-74-1

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Sample Number

LF63412



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Pesticides Analysis by GC/MS						
Hexachlorocyclohexane (alpha-BHC)	Not Detected	05/18/2015	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	05/18/2015	0.001		EPA 525.2	319-85-7
Hexachlorocyclohexane (delta-BHC)	Not Detected	05/18/2015	0.001		EPA 525.2	319-86-8
Hexachlorocyclopentadiene	Not Detected	05/18/2015	0.0005	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	05/18/2015	0.0001	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	05/18/2015	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	05/18/2015	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	05/18/2015	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	05/18/2015	0.0005		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	05/18/2015	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1221)	Not Detected	05/18/2015	0.0001	0.0005	EPA 525.2	11104-28-2
PCB (aroclor 1232)	Not Detected	05/18/2015	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	05/18/2015	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	05/18/2015	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	05/18/2015	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	05/18/2015	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	05/18/2015	0.0001		EPA 525.2	59536-65-1
Simazine	Not Detected	05/18/2015	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	05/18/2015	0.001	0.003	EPA 525.2	8001-35-2
Volatile Organic Compounds						
1,1 Dichloroethane	Not Detected	05/14/2015	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	05/14/2015	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	05/14/2015	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	05/14/2015	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	05/14/2015	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	05/14/2015	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	05/14/2015	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	05/14/2015	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	05/14/2015	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	05/14/2015	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	05/14/2015	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	05/14/2015	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	05/14/2015	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	05/14/2015	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	05/14/2015	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	05/14/2015	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	05/14/2015	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	05/14/2015	0.0005	0.075	EPA 524.2	106-46-7

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Sample Number
LF63412

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
2,2 Dichloropropane	Not Detected	05/14/2015	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	05/14/2015	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	05/14/2015	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	05/14/2015	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.0099	05/14/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0013	05/14/2015	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	05/14/2015	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	05/14/2015	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	05/14/2015	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.0077	05/14/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	05/14/2015	0.0005		EPA 524.2	75-00-3
Chloroform	0.0072	05/14/2015	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	05/14/2015	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	05/14/2015	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	05/14/2015	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	05/14/2015	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	05/14/2015	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	05/14/2015	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	05/14/2015	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	05/14/2015	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	05/14/2015	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	05/14/2015	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	05/14/2015	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	05/14/2015	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	05/14/2015	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	05/14/2015	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	05/14/2015	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	05/14/2015	0.0005		EPA 524.2	104-51-8
n-Propylbenzene	Not Detected	05/14/2015	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	05/14/2015	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	05/14/2015	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	05/14/2015	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	05/14/2015	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	05/14/2015	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	05/14/2015	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	05/14/2015	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	05/14/2015	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	05/14/2015	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	05/14/2015	0.0005	1	EPA 524.2	108-88-3

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Sample Number

LF63412



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Total Trihalomethanes	0.026	05/14/2015	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	05/14/2015	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	05/14/2015	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	05/14/2015	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	05/14/2015	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	05/14/2015	0.0005	0.002	EPA 524.2	75-01-4

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**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

DEQ
RESOURCE MANAGEMENT DIVISION
MAY 05 2015
LANSING DISTRICT

Facility: C0211290

City of Flint Water Plant
4500 North Dort Highway
Flint MI 48505
United States

Result COMPLETE**Report Date 30-APR-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-00173938
Project Number	10005233 (CL04)
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 Levanseler
Kerri Levanseler - Director, Chemistry Laboratory

Date 30-APR-2015

172310

**NSF International**789 N. Dixboro Rd., Ann Arbor, MI 48105, USA
1-800.NSF.MARK | +1-734.769.8010 | www.nsf.org

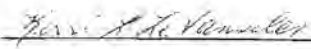
TEST REPORT

Send To: C0211289Mr. 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	02-APR-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-00157090		
Project Number	10005233 (CL03)		
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 Levanseler - Director, Chemistry Laboratory**Date** 02-APR-2015DEO
LANSING DISTRICT

APR 07 2015

LANSING DISTRICT

**General Information**

Standard: USFDA CFR Title 21 Part 165.110
Date and Time Sampled: 4/20/2015 08:10 EDT
Product Description: Municipal Water
Test Description: Bromate - April 2015

Sample Id: **S-0001148608**
Description: Municipal Water - 4/20/2015 08:10 EDT
Sampled Date: 04/20/2015
Received Date: 04/21/2015

Testing Parameter	Reporting Limit	Result	FDA SOQ	Units	P / F
Disinfection Residuals/Disinfection By-Products					
Bromate	10	ND	10	ug/L	Pass



02710

General Information

Standard: USFDA CFR Title 21 Part 165.110

Date and Time Sampled: 3/27/2015 08:00 EDT

Product Description: Municipal Water

Test Description: Bromate - March

Sample Id: S-0001141163

Description: Municipal Water - 3/27/2015 08:00 EDT

Sampled Date: 03/27/2015

Received Date: 03/31/2015

Testing Parameter	Reporting Limit	Result	FDA SOQ	Units	P / F
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Disinfection Residuals/Disinfection By-Products

Bromate	5	ND	10	ug/L	Pass
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<<Additional Information>>

Sample Id: S-0001141163

Test Parameter	Date Analyzed	Time Analyzed	Date Prepared/ Processed
Disinfection Residuals/Disinfection By-Products			
Bromate (Ref: EPA 300.1)	31-MAR-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.

**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
LF57073

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	03/16/2015 11:43
Sample Point:	PS4 3MG WELL	Date Received:	03/17/2015 11:22
Water System:	Treated Public Distribution System	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
1,1 Dichloroethane	Not Detected	03/20/2015	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	03/20/2015	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	03/20/2015	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	03/20/2015	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	03/20/2015	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	03/20/2015	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	03/20/2015	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	03/20/2015	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	03/20/2015	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	03/20/2015	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	03/20/2015	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	03/20/2015	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	03/20/2015	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	03/20/2015	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	03/20/2015	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	03/20/2015	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	03/20/2015	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	03/20/2015	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichloropropane	Not Detected	03/20/2015	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	03/20/2015	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	03/20/2015	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	03/20/2015	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.0051	03/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0007	03/20/2015	0.0005	0.080	EPA 524.2	75-25-2

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

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

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



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
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USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF57073

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Bromomethane	Not Detected	03/20/2015	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	03/20/2015	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	03/20/2015	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.0040	03/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	03/20/2015	0.0005		EPA 524.2	75-00-3
Chloroform	0.0052	03/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	03/20/2015	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	03/20/2015	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	03/20/2015	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	03/20/2015	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	03/20/2015	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	03/20/2015	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	03/20/2015	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	03/20/2015	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	03/20/2015	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	03/20/2015	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	03/20/2015	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	03/20/2015	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	03/20/2015	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	03/20/2015	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	03/20/2015	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	03/20/2015	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	03/20/2015			EPA 524.2	
n-Propylbenzene	Not Detected	03/20/2015	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	03/20/2015	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	03/20/2015	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	03/20/2015	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	03/20/2015	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	03/20/2015	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	03/20/2015	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	03/20/2015	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	03/20/2015	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	03/20/2015	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	03/20/2015	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.015	03/20/2015	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	03/20/2015	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	03/20/2015	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	03/20/2015	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	03/20/2015	0.0005	0.005	EPA 524.2	79-01-6

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

LF57073



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Volatile Organic Compounds

Vinyl chloride	Not Detected	03/20/2015	0.0005	0.002	EPA 524.2	75-01-4
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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)
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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
LF61848

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:	4500 N DORT HWY, FLINT	Source:	Surface Water
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/01/2015 08:20
Sample Point:	RAW WATER INTAKE	Date Received:	05/04/2015 10:22
Water System:	Public System Surface Water	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	7.34	05/05/2015	0.5		SM 5310C	TOC-00-C

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

Sample Number
LF61847

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/01/2015 08:15
Sample Point:	PS4 3MG WELL	Date Received:	05/04/2015 10:21
Water System:	Treated Public Distribution System	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	2.19	05/05/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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



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

Sample Number
LF60545

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: PS4 3MG WELL
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 04/20/2015 09:15
Date Received: 04/21/2015 10:41
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
1,1 Dichloroethane	Not Detected	04/22/2015	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	04/22/2015	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	04/22/2015	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	04/22/2015	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	04/22/2015	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	04/22/2015	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	04/22/2015	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	04/22/2015	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	04/22/2015	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	04/22/2015	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	04/22/2015	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	04/22/2015	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	04/22/2015	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	04/22/2015	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	04/22/2015	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	04/22/2015	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	04/22/2015	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	04/22/2015	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichloropropane	Not Detected	04/22/2015	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	04/22/2015	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	04/22/2015	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	04/22/2015	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.014	04/22/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0018	04/22/2015	0.0005	0.080	EPA 524.2	75-25-2

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**

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P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF60545



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Bromomethane	Not Detected	04/22/2015	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	04/22/2015	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	04/22/2015	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.011	04/22/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	04/22/2015	0.0005		EPA 524.2	75-00-3
Chloroform	0.016	04/22/2015	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	04/22/2015	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	04/22/2015	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	04/22/2015	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	04/22/2015	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	04/22/2015	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	04/22/2015	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	04/22/2015	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	04/22/2015	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	04/22/2015	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	04/22/2015	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	04/22/2015	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	04/22/2015	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	04/22/2015	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	04/22/2015	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	04/22/2015	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	04/22/2015	0.0005		EPA 524.2	104-51-8
n-Propylbenzene	Not Detected	04/22/2015	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	04/22/2015	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	04/22/2015	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	04/22/2015	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	04/22/2015	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	04/22/2015	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	04/22/2015	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	04/22/2015	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	04/22/2015	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	04/22/2015	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	04/22/2015	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.043	04/22/2015	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	04/22/2015	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	04/22/2015	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	04/22/2015	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	04/22/2015	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	04/22/2015	0.0005	0.002	EPA 524.2	75-01-4

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
LF60545

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Volatile Organic Compounds

Unidentified hydrocarbon peak(s) were detected.

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
LF60544

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Cass	Date Collected:	04/20/2015 08:00
Sample Point:	PS4 3MG WELL	Date Received:	04/21/2015 10:41
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	2.44	04/21/2015	0.5		SM 5310C	TOC-00-C

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

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

VanBuren/Cass County Health Dept.
201 M-62 North
Cassopolis, MI 49031
269 445-5280

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

LF60543

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: RAW WATER INTAKE
Water System: Public System Surface Water

WSSN/Pool ID: 2310
Source: Surface Water
Site Code:
Collector: Public Water Supply Operator
Date Collected: 04/20/2015 07:55
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 #
Total Organic Carbon	7.43	04/21/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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



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

Sample Number
LF57072

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: RAW WATER INTAKE
Water System: Public System Surface Water

WSSN/Pool ID: 2310
Source: Surface Water
Site Code:
Collector: Public Water Supply Operator
Date Collected: 03/16/2015 11.48
Date Received: 03/17/2015 11.22
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	7.22	03/18/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



Sample Number
LF57071

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: PS4 3MG WELL
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 03/16/2015 11:40
Date Received: 03/17/2015 11:22
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	2.97	03/18/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

**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: C0211289Mr. Michael Glasgow
City of Flint, Municipality
1101 South Saginaw Street
Flint, MI 48502DEQ
RECEIVED MANAGEMENT DIVISION
MAR 10 2015
LANSING DISTRICT**Facility: C0211290**City of Flint Water Plant
4500 North Dort Highway
Flint MI 48505
United States

Result	COMPLETE	Report Date	03-MAR-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-00168002		
Project Number	10005233 (CL02)		
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 Levanseler - Director, Chemistry Laboratory

Date

03-MAR-2015

**General Information**

Standard: USFDA CFR Title 21 Part 165.110
Date and Time Sampled: 2/18/2015 08:41 EST
Product Description: Municipal Water

Sample Id: **S-0001126485**
Description: Municipal Source - 2/18/2015 08:41 EST
Sampled Date: 02/18/2015
Received Date: 02/19/2015

Testing Parameter	Reporting Limit	Result	FDA SOQ	Units	P / F
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Disinfection Residuals/Disinfection By-Products

Bromate	5	13	10	ug/L	Fail
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<<Additional Information>>

Sample Id: S-0001126485

Test Parameter	Date Analyzed	Time Analyzed	Date Prepared/ Processed
Disinfection Residuals/Disinfection By-Products			
Bromate (Ref: EPA 300.1)	25-FEB-2015		

The NSF logo is a circular emblem with the letters "NSF" in a bold, sans-serif font. The logo is positioned in the upper left corner of the page, just below the header number.**Job Notes:**

Sample exceeds FDA limits for Bromate


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.

**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	30-JAN-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-00168001		
Project Number	10005233 (CL01)		
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 Levanseler

Kerri Levanseler - Director, Chemistry Laboratory

Date 30-JAN-2015

**General Information**

Standard: USFDA CFR Title 21 Part 165.110

Date and Time Sampled: 1/26/2015 09:40 EST

Product Description: Municipal Water

Sample Id: S-0001121489

Description: Municipal Water - 1/26/2015 09:40 EST

Sampled Date: 01/26/2015

Received Date: 01/27/2015

Testing Parameter	Reporting Limit	Result	FDA SOQ	Units	P / F
Disinfection Residuals/Disinfection By-Products					
Bromate	10	19	10	ug/L	Fail

**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: C0211289Mr. 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 06-MAR-2015**

Customer Name	City of Flint, Municipality
Tested To	USFDA CFR Title 21 Part 165.110
Description	Municipal Water Sample
Test Type	Test Only
Job Number	J-00169592
Project Number	10005233 (CL13)
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 Levanseler - Director, Chemistry Laboratory

Date 06-MAR-2015



General Information

Standard: USFDA CFR Title 21 Part 165.110
 Date and Time Sampled: 2/18/2015 08:47 EST
 Product Description: Municipal Water Sample
 Test Description: Quarter 1 - Radiological Test - Gross Alpha & Radium 226/228

Sample Id: S-0001126486
 Description: Municipal Water Sample - 2/18/2015 08:47 EST
 Sampled Date: 02/18/2015
 Received Date: 02/19/2015

Testing Parameter	Reporting Limit	Result	FDA SOQ	Units	P / F
Radiologicals					
Radium-226	1	ND		pCi/L	
Radium-226, Radium-228 Combined	1	ND	5	pCi/L	Pass
Radium-228	1	ND		pCi/L	
P1 Gross Alpha	3	ND	15	pCi/L	Pass
P1 Gross Beta	4	ND	50	pCi/L	Pass



<<Additional Information>>

Sample Id: S-0001126486

Test Parameter	Date Analyzed	Time Analyzed	Date Prepared/ Processed
Radiologicals			
Total Radium-226, Radium-228 Combined Activity	6-MAR-2015		
Gross Alpha and Beta Radioactivity in Drinking Water (Ref: EPA 900.0)	27-FEB-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
C0842	Gross Alpha and Beta Radioactivity in Drinking Water (Ref: EPA 900.0)
C0980	Total Radium-226, Radium-228 Combined Activity

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/enevs/documents/minimum_detection_level_spreadsheet.pdf.



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
LF54660

Official Laboratory Report

Report To: E. L. W.
J. P. WY
J. T.

System Name: er CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well: /
County: Genesee
Sample Point: PLANT TAP CN@SCE
Water System: Integrated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 02/16/2015 09:40
Date Received: 02/17/2015 10:46
Purpose: Routine Monitoring

A. f.	TESTING INFORMATION			REGULATORY INFORMATION		
	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	02/18/2015	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	02/18/2015	0.002	0.010	EPA 200.8	7440-38-2
Barium	Not detected	02/18/2015	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	02/18/2015	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	02/18/2015	0.0003	0.005	EPA 200.8	7440-43-9
Chloride	99	02/17/2015	4		SM 4500-Cl E	7647-14-5
Chromium	Not detected	02/18/2015	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Avail	Not Detected	02/19/2015	0.02	0.2	OIA-1677	57-12-5
Fluoride	0.57	02/17/2015	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as Ca	180	02/17/2015	20		SM 2340 C	HARD-00-C
Iron (automatic)	Not detected	02/17/2015	0.1		SM 3500 FeB	7439-89-6
Lead	Not detected	02/18/2015	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not Detected	02/18/2015	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	02/18/2015	0.01	0.1	EPA 200.8	7440-02-0
Nitrate as N	1.3	02/17/2015	0.4	10	10-107-04-2-B	14797-55-8
Nitrite as N	Not detected	02/17/2015	0.05	1	10-107-04-2-B	14797-65-0
Selenium	0.001	02/18/2015	0.001	0.05	EPA 200.8	7782-49-2
Sodium (auto)	25	02/17/2015	5		SM 3500 NaB	7440-23-5
Sulfate	40	02/17/2015	10		SM 4500 SO4E	14808-79-8
Thallium	Not detected	02/18/2015	0.0002	0.002	EPA 200.8	7440-28-0

Carbamates by

CAS#: Che
MCL: Ma
AL: Act
RL: Re

Registry Number
w/d

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

DE

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
LF54660

TEST INFORMATION			REGULATORY INFORMATION			
Analysis	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Carbamates by						
3 Hydroxycarb	Not Detected	02/19/2015	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	02/19/2015	0.0005		EPA 531.2	116-06-3
Aldicarb sulf	Not Detected	02/19/2015	0.0005		EPA 531.2	1646-88-4
Aldicarb sulf	Not Detected	02/19/2015	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	02/19/2015	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	02/19/2015	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	02/19/2015	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	02/19/2015	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	02/19/2015	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	02/19/2015	0.001		EPA 531.2	114-26-1
Chlorinated A						
2,4,5-T	Not Detected	02/27/2015	0.002		EPA 515.4	93-76-5
2,4,5-TP (sil	Not Detected	02/27/2015	0.0002	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	02/27/2015	0.001	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	02/27/2015	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	02/27/2015	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	02/27/2015	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	02/27/2015	0.0002	0.007	EPA 515.4	88-85-7
Pentachlorop	Not Detected	02/27/2015	0.00004	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	02/27/2015	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA & di-acid	Not Detected	02/27/2015	0.001		EPA 515.4	1861-32-1
Pesticides Analy						
4,4'-DDD	Not Detected	02/23/2015	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	02/23/2015	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	02/23/2015	0.0005		EPA 525.2	50-29-3
Acetochlor	Not Detected	02/23/2015	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	02/23/2015	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	02/23/2015	0.0004		EPA 525.2	309-00-2
alpha-Chlor	Not Detected	02/23/2015	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	Not Detected	02/23/2015	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	02/23/2015	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	02/23/2015	0.0001	0.002	EPA 525.2	72-20-8
Endrin aldehy	Not Detected	02/23/2015	0.001		EPA 525.2	7421-93-4
gamma-Chlor	Not Detected	02/23/2015	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	02/23/2015	0.0002	0.0004	EPA 525.2	76-44-8
Heptachlor ep	Not Detected	02/23/2015	0.0001	0.0002	EPA 525.2	1024-57-3

CAS# : C
MCL : C
AL : A
RL : R

Registry Number

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

LF54660



TEST INFORMATION			REGULATORY INFORMATION			
	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Pesticides Analy						
Hexachlorocyclopentadiene	Not Detected	02/23/2015	0.0001	0.001	EPA 525.2	118-74-1
Hexachlorocyclopentadiene (C)	Not Detected	02/23/2015	0.001		EPA 525.2	319-84-6
Hexachlorocyclopentadiene (C)	Not Detected	02/23/2015	0.001		EPA 525.2	319-85-7
Hexachlorocyclopentadiene (C)	Not Detected	02/23/2015	0.001		EPA 525.2	319-86-8
Hexachlorocyclopentadiene	Not Detected	02/23/2015	0.0005	0.05	EPA 525.2	77-47-4
Lindane (gamma)	Not Detected	02/23/2015	0.0001	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	02/23/2015	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	02/23/2015	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	02/23/2015	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	02/23/2015	0.0005		EPA 525.2	2212-67-1
PCB (aroclor 1248)	Not Detected	02/23/2015	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1254)	Not Detected	02/23/2015	0.0001	0.0005	EPA 525.2	11104-28-2
PCB (aroclor 1260)	Not Detected	02/23/2015	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1268)	Not Detected	02/23/2015	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1270)	Not Detected	02/23/2015	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1276)	Not Detected	02/23/2015	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1280)	Not Detected	02/23/2015	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	02/23/2015	0.0001		EPA 525.2	59536-65-1
Simazine	Not Detected	02/23/2015	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	02/23/2015	0.001	0.003	EPA 525.2	8001-35-2

Quality control results were outside allowed limits due to matrix interferences.

Volatile Org.						
1,1 Dichloroethene	Not Detected	02/17/2015	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethene	Not Detected	02/17/2015	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloroethene	Not Detected	02/17/2015	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethene	Not Detected	02/17/2015	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethene	Not Detected	02/17/2015	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethene	Not Detected	02/17/2015	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethene	Not Detected	02/17/2015	0.0005		EPA 524.2	79-34-5
1,2 Dichloroethene	Not Detected	02/17/2015	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethene	Not Detected	02/17/2015	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloroethene	Not Detected	02/17/2015	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichloroethene	Not Detected	02/17/2015	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloroethene	Not Detected	02/17/2015	0.0005		EPA 524.2	96-18-4
1,2,4 Trichloroethene	Not Detected	02/17/2015	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylenes	Not Detected	02/17/2015	0.0005		EPA 524.2	95-63-6
1,3 Dichloroethene	Not Detected	02/17/2015	0.0005		EPA 524.2	541-73-1
1,3 Dichloroethene	Not Detected	02/17/2015	0.0005		EPA 524.2	142-28-9

CAS# :
MCL :
AL :
RL :

Number

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

By author:

Work Order 50201285_01

Report Created on: 3/5/2015 12:22:11PM

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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
LF54660

ANALYTICAL INFORMATION		REGULATORY INFORMATION					
	Unit	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Org	umg						
1,3,5 Trime	ize	Not Detected	02/17/2015	0.0005		EPA 524.2	108-67-8
1,4 Dichlor	ne	Not Detected	02/17/2015	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichlor	ne	Not Detected	02/17/2015	0.0005		EPA 524.2	594-20-7
Benzene		Not Detected	02/17/2015	0.0005	0.005	EPA 524.2	71-43-2
Bromobenz		Not Detected	02/17/2015	0.0005		EPA 524.2	108-86-1
Bromochlor	ene	Not Detected	02/17/2015	0.0005		EPA 524.2	74-97-5
Bromodichl	or	0.0030	02/17/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform		0.0007	02/17/2015	0.0005	0.080	EPA 524.2	75-25-2
Bromometh		Not Detected	02/17/2015	0.001		EPA 524.2	74-83-9
Carbon tetr	ide	Not Detected	02/17/2015	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenz		Not Detected	02/17/2015	0.0005	0.1	EPA 524.2	108-90-7
Chlorodib		0.0025	02/17/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroetha		Not Detected	02/17/2015	0.0005		EPA 524.2	75-00-3
Chloroform		0.0018	02/17/2015	0.0005	0.080	EPA 524.2	67-66-3
Chlorometh		Not Detected	02/17/2015	0.0005		EPA 524.2	74-87-3
cis-1,2 Di	yl	Not Detected	02/17/2015	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dich	lor	Not Detected	02/17/2015	0.0005		EPA 524.2	10061-01-5
Dibromom		Not Detected	02/17/2015	0.0005		EPA 524.2	74-95-3
Dichloroch	lor	Not Detected	02/17/2015	0.001		EPA 524.2	75-71-8
Dichloro		Not Detected	02/17/2015	0.0006	0.005	EPA 524.2	75-09-2
Ethylben		Not Detected	02/17/2015	0.0005	0.7	EPA 524.2	100-41-4
Fluorotri	chlor	Not Detected	02/17/2015	0.001		EPA 524.2	75-69-4
Hexachlor	ocyc	Not Detected	02/17/2015	0.0005		EPA 524.2	87-68-3
Isopropylb		Not Detected	02/17/2015	0.0005		EPA 524.2	98-82-8
m & p-Xyl		Not Detected	02/17/2015	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl chl	oride	Not Detected	02/17/2015	0.005		EPA 524.2	78-93-3
Methyl chl	oride	Not Detected	02/17/2015	0.005		EPA 524.2	108-10-1
Methyl chl	oride	Not Detected	02/17/2015	0.001		EPA 524.2	1634-04-4
Naphthal		Not Detected	02/17/2015	0.0005		EPA 524.2	91-20-3
n-Butyl		Not Detected	02/17/2015	0.0005		EPA 524.2	104-51-8
Nitroben		Not Detected	02/17/2015			EPA 524.2	
n-Propyl		Not Detected	02/17/2015	0.0005		EPA 524.2	103-65-1
o-Chlorot		Not Detected	02/17/2015	0.0005		EPA 524.2	95-49-8
o-Xylene		Not Detected	02/17/2015	0.0005	10	EPA 524.2	95-47-6
p-Chloro		Not Detected	02/17/2015	0.0005		EPA 524.2	106-43-4
p-Isoprop		Not Detected	02/17/2015	0.0005		EPA 524.2	99-87-6
sec-But		Not Detected	02/17/2015	0.0005		EPA 524.2	135-98-8
Styrene		Not Detected	02/17/2015	0.0005	0.1	EPA 524.2	100-42-5
tert-But		Not Detected	02/17/2015	0.0005		EPA 524.2	98-06-6

C
 MCL
 MPN
 CFU

Sample Number

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

By

Work Order 5020125_01

Report Created on: 3/5/2015 12:22:11PM

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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
LF54660

TEST INFORMATION			REGULATORY INFORMATION			
	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile	Not Detected	02/17/2015	0.0005	0.005	EPA 524.2	127-18-4
Tetrachloro	Not Detected	02/17/2015	0.005		EPA 524.2	109-99-9
Tetrahydro	Not Detected	02/17/2015	0.0005	1	EPA 524.2	108-88-3
Toluene	Not Detected	02/17/2015	NA	0.080	EPA 524.2	TTHM-00-C
Total Trihalomethanes	Not Detected	02/17/2015	NA	10	EPA 524.2	1330-20-7
trans-1,2-Dichloroethene	Not Detected	02/17/2015	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3-Dichloroethene	Not Detected	02/17/2015	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	02/17/2015	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	02/17/2015	0.0005	0.002	EPA 524.2	75-01-4

Other peaks(s) were detected.

Drinking water laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in
 CFR parts 141-143, and other regulatory agencies as appropriate.

For more information about the quality of drinking water in your area. If you have
 need to the test results of your sample, please contact the Environmental Health
 phone number listed below:

1-800-292-3700

C/A
 M
 J
 C
 J

Number

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

By a

Work Order 50201285_01

Report Created on: 3/5/2015 12:22:11PM

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**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
LF54942

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 6204 N SAGINAW ST, FLINT
Collected By: KEVIN MCLEOD
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM SINK
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: DBP 8
Collector: Public Water Supply Operator
Date Collected: 02/17/2015 12:51
Date Received: 02/19/2015 11:12
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/24/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	02/24/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/24/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/24/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	02/24/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.009	02/24/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0049	02/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0014	02/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0048	02/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0038	02/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0149	02/20/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

Laboratory Contacts:
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George 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
LF54941

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:	5018 CLIO RD, FLINT	Source:	TYPE I
Collected By:	KEVIN MCLEOD	Site Code:	DBP 7
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	02/17/2015 12:34
Sample Point:	BATHROOM SINK	Date Received:	02/19/2015 11:12
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/24/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	02/24/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/24/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/24/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	02/24/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.009	02/24/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0066	02/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0018	02/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0060	02/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0048	02/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0192	02/20/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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



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

Sample Number
LF54938

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3216 MLK BLVD, FLINT
Collected By: KEVIN MCLEOD
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: DBP.6 7
Collector: Public Water Supply Operator
Date Collected: 02/17/2015 12:15
Date Received: 02/19/2015 11:12
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/24/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	Not Detected	02/24/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/24/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/24/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	02/24/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	Not Detected	02/24/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.002	02/24/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0093	02/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0026	02/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0075	02/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0091	02/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0285	02/20/2015	0.0005	0.080	EPA 524.2	TTM-00-C

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

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

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

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

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

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

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



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

Sample Number
LF54662

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	02/16/2015 11:55
Sample Point:	RAW WATER INTAKE	Date Received:	02/17/2015 10:47
Water System:	Public System Surface Water	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	5.95	02/25/2015	0.5		SM 5310C	TOC-00-C

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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

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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
LF54661

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHERD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	02/16/2015 11:50
Sample Point:	PS4 (3MG WELL)	Date Received:	02/17/2015 10:47
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	2.07	02/25/2015	0.5		SM 5310C	TOC-00-C

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

Sample Number
LF54936

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 2501 FLUSHING RD, FLINT
Collected By: KEVIN MCLEOD
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN SINK
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: DBP #5
Collector: Public Water Supply Operator
Date Collected: 02/17/2015 11:50
Date Received: 02/19/2015 11:12
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/24/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	02/24/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/24/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/24/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	02/24/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.009	02/24/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0084	02/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0023	02/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0078	02/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0060	02/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0245	02/20/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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
LF54936

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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

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

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MCL : Maximum Contaminant Level
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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
LF54937

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3606 CORUNNA RD, FLINT
Collected By: KEVIN MCLEOD
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: DBP 4 5
Collector: Public Water Supply Operator
Date Collected: 02/17/2015 11:35
Date Received: 02/19/2015 11:12
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/24/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	02/24/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/24/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/24/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	02/24/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.009	02/24/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0062	02/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0017	02/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0058	02/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0044	02/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0181	02/20/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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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 Preper
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
LF54943

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3202 S DORT HWY, FLINT
Collected By: KEVIN MCLEOD
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: DBP 3
Collector: Public Water Supply Operator
Date Collected: 02/17/2015 11:12
Date Received: 02/19/2015 11:12
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/24/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	02/24/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/24/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/24/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	02/24/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.009	02/24/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0056	02/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0017	02/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0055	02/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0040	02/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0168	02/20/2015	0.0005	0.080	EPA 524.2	TTHM-00-C

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Genesee County Health Dept.
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 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
LF54939

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:	822 S DORT HWY, FLINT	Source:	TYPE I
Collected By:	KEVIN MCLEOD	Site Code:	DBP 2
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	02/17/2015 10:55
Sample Point:	BATHROOM	Date Received:	02/19/2015 11:12
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/24/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	02/24/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/24/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/24/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	02/24/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.009	02/24/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0066	02/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0020	02/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0065	02/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0048	02/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0199	02/20/2015	0.0005	0.080	EPA 524.2	TTM-00-C

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Flint, MI 48502-1540
810 257-3603

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mg/L : milligrams / Liter (ppm)
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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

**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
LF54940

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3719 DAVISON RD, FLINT
Collected By: KEVIN MCLEOD
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: DBP 1
Collector: Public Water Supply Operator
Date Collected: 02/17/2015 10:39
Date Received: 02/19/2015 11:12
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/24/2015	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	02/24/2015	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/24/2015	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/24/2015	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	02/24/2015	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.009	02/24/2015	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.002	02/24/2015	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0057	02/20/2015	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0015	02/20/2015	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0054	02/20/2015	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0036	02/20/2015	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0162	02/20/2015	0.0005	0.080	EPA 524.2	TTM-00-C

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Flint, MI 48502-1540
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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 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
LF54944

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:	212 BROWNING AVE, FLINT	Source:	TYPE I
Collected By:	MIEK GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	02/11/2015 10:20
Sample Point:	BATHROOM TOILET TANK	Date Received:	02/19/2015 11:13
Water System:	Treated Public Distribution System	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.11	02/24/2015	0.05	1.3	EPA 200.8	7440-50-8
Iron	1.63	02/24/2015	0.02		EPA 200.8	7439-89-6
Manganese	0.18	02/24/2015	0.01		EPA 200.8	7439-96-5
Zinc	0.20	02/24/2015	0.01		EPA 200.8	7440-66-6

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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
LF52711

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: S C R (US)
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 01/22/2015 13:40
Date Received: 01/23/2015 08:36
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	5.16	01/27/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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



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

Sample Number
LF52710

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: S C E (5)
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 01/22/2015 13:30
Date Received: 01/23/2015 08:36
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	3.05	01/27/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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



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

Sample Number
LF52709

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	01/22/2015 12:55
Sample Point:	PS4	Date Received:	01/23/2015 08:36
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 #
Total Organic Carbon	3.21	01/27/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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



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

Sample Number
LF52708

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	01/22/2015 12:45
Sample Point:	RAW WATER INTAKE	Date Received:	01/23/2015 08:36
Water System:	Public System Surface Water	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	7.62	01/27/2015	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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



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

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

Sample Number
LF52712

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: PLANT TAP
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 01/22/2015 10:00
Date Received: 01/23/2015 08:37
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	01/28/2015	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	01/28/2015	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.01	01/28/2015	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	01/28/2015	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	01/28/2015	0.0003	0.005	EPA 200.8	7440-43-9
Chromium	Not detected	01/28/2015	0.01	0.1	EPA 200.8	7440-47-3
Lead	Not detected	01/28/2015	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	01/28/2015	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	01/28/2015	0.01	0.1	EPA 200.8	7440-02-0
Selenium	0.001	01/28/2015	0.001	0.05	EPA 200.8	7782-49-2
Thallium	Not detected	01/28/2015	0.0002	0.002	EPA 200.8	7440-28-0

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

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

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

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

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

**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

DEQ
RESOURCE MANAGEMENT DIVISION
JAN 8 11 2015
LANING DISTRICT

Facility: C0211290

City of Flint Water Plant
4500 North Dort Highway
Flint MI 48505
United States

Result COMPLETE**Report Date 07-JAN-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-00148767
Project Number	9841598 (CL04)
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 Levanseler

Date 07-JAN-2015

Kerri Levanseler - Director, Chemistry Laboratory

**General Information**

Standard: USFDA CFR Title 21 Part 165.110
Date and Time Sampled: 12/22/2014 08:46 EST
Product Description: Municipal Water
Test Description: Bromate - December

Sample Id: S-0001113631
Description: Municipal Water - 12/22/2014 08:46 EST
Sampled Date: 12/22/2014
Received Date: 12/23/2014

Testing Parameter	Reporting Limit	Result	FDA SOQ	Units	P / F
Disinfection Residuals/Disinfection By-Products					
Bromate	10	23	10	ug/L	Fail



<<Additional Information>>

Sample Id: S-0001113631

Test Parameter	Date Analyzed	Time Analyzed	Date Prepared/ Processed
Disinfection Residuals/Disinfection By-Products			
Bromate (Ref: EPA 300.1)	30-DEC-2014		

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 detection limit for the instrument.

For a list of NSF International Method Detection Limits refer to
http://www.nsf.org/media/enews/documents/minimum_detection_level_spreadsheet.pdf.

**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
LF50139

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:	4500 N DORT HWY, FLINT	Source:	Surface Water
Collected By:	CHRIS BEATENHEAD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	12/15/2014 11:55
Sample Point:	RAW WATER INTAKE	Date Received:	12/18/2014 09:14
Water System:	Public System Surface Water	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	6.49	12/18/2014	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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



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

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

**Sample Number
LF50138**

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	
Collection Address:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHERD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	12/15/2014 11:48
Sample Point:	PS4 - 3MG WELL	Date Received:	12/18/2014 09:14
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

Sample Comment LF50138 **Corrected report. County was corrected.**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	2.59	12/18/2014	0.5		SM 5310C	TOC-00-C

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

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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

**General Information**

Standard: EPA_DWR

Date and Time Sampled: 11/24/2014 09:26 EST

Product Description: Qtr 4 - Water Sample

Sample Id: S-0001103517

Description: Qtr 4 - Water Sample - 11/24/2014 09:26 EST

Sampled Date: 11/24/2014

Received Date: 11/25/2014

Testing Parameter	Reporting Limit	Result	Units
Radiologicals			
Radium-226	1	ND	pCi/L
Radium-226, Radium-228 Combined	1	ND	pCi/L
Radium-228	1	ND	pCi/L
P1 Gross Alpha	3	ND	pCi/L
P1 Gross Beta	4	ND	pCi/L

**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 05-DEC-2014**

Customer Name	City of Flint, Municipality
Tested To	EPA_DWR
Description	Qtr 4 - Water Sample
Test Type	Test only
Job Number	J-00142265
Project Number	9329404 (CL03)
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 Levanseler - Director, Chemistry Laboratory

Date 05-DEC-2014

**General Information**

Standard: USFDA CFR Title 21 Part 165.110
Date and Time Sampled: 11/24/2014 09:21 EST
Product Description: Municipal Water
Test Description: Bromate - November

Sample Id: **S-0001103518**
Description: Municipal Water - 11/24/2014 09:21 EST
Sampled Date: 11/24/2014
Received Date: 11/25/2014

Testing Parameter	Reporting Limit	Result	FDA SOQ	Units	P / F
Disinfection Residuals/Disinfection By-Products					
Bromate	10	ND	10	ug/L	Pass


NSF International

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TEST REPORT

Send To: C0211289

Mr. Michael Glasgow
City of Flint, Municipality
1101 South Saginaw Street
Flint, MI 48502

DEQ
RESOURCE MANAGEMENT DIVISION
DEC 10 2014
LANSING DISTRICT

Facility: C0211290

City of Flint Water Plant
4500 North Dort Highway
Flint MI 48505
United States

Result	COMPLETE	Report Date	03-DEC-2014
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-00148751		
Project Number	9841598 (CL03)		
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 Levanseler
Kerri Levanseler - Director, Chemistry Laboratory

Date 03-DEC-2014

**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
LF46074**

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	11/11/2014 09:18
Sample Point:	RAW WATER INTAKE	Date Received:	11/12/2014 13:48
Water System:	Public System Surface Water	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	7.27	11/13/2014	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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



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

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

Sample Number
LF46076

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	11/11/2014 09:06
Sample Point:	PS4 WELL	Date Received:	11/12/2014 13:49
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	3.41	11/13/2014	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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



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

Sample Number
LF46075

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: S.C.E
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 11/11/2014 08:40
Date Received: 11/12/2014 13:49
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	3.86	11/13/2014	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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

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



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

Sample Number
LF44688

Official Laboratory Report

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

System Name/Owner: MIKE GLASGOW
Collection Address: 9363 KRISTEN DR, OTISVILLE
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN SINK
Water System: Untreated Private Well

WSSN/Pool ID: 2310
Source: Single Family Dwelling
Site Code:
Collector: Public Water Supply Operator
Date Collected: 10/22/2014 17:15
Date Received: 10/29/2014 11:15
Purpose: Other

Nota CMETZ

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Arsenic	Not detected	10/30/2014	0.002	0.010	EPA 200.8	7440-38-2
Barium	Not detected	10/30/2014	0.01	2	EPA 200.8	7440-39-3
Cadmium	Not detected	10/30/2014	0.0003	0.005	EPA 200.8	7440-43-9
Chromium	Not detected	10/30/2014	0.01	0.1	EPA 200.8	7440-47-3
Copper	Not detected	10/30/2014	0.05	1.3	EPA 200.8	7440-50-8
Iron	Not detected	10/30/2014	0.02		EPA 200.8	7439-89-6
Lead	Not detected	10/30/2014	0.001	0.015	EPA 200.8	7439-92-1
Manganese	Not detected	10/30/2014	0.01		EPA 200.8	7439-96-5
Mercury	Not detected	10/30/2014	0.0001	0.002	EPA 200.8	7439-97-6
Selenium	Not detected	10/30/2014	0.001	0.05	EPA 200.8	7782-49-2
Zinc	Not detected	10/30/2014	0.01		EPA 200.8	7440-66-6

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
LF43433

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MIKE GLASGOW	Site Code	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	10/15/2014 14:15
Sample Point:	RAW WATER INTAKE	Date Received:	10/17/2014 08:54
Water System:	Public System Surface Water	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	7.38	10/17/2014	0.5		SM 5310C	TOC-00-C

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

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

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

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

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



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

Sample Number
LF43432

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATONHEAD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	10/15/2014 14:15
Sample Point:	PS4 WELL	Date Received:	10/17/2014 08:54
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	2.99	10/17/2014	0.5		SM 5310C	TOC-00-C

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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

**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 08-OCT-2014**

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-00148744
Project Number	9841598 (CL05)
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 Levanseler
Kerri Levanseler - Director, Chemistry Laboratory

Date 08-OCT-2014

DEQ
RESOURCE MANAGEMENT DIVISION

OCT 14 2014
LANSING DISTRICT

**General Information**

Standard: USFDA CFR Title 21 Part 165.110

Date and Time Sampled: 9/24/2014 09:00 EDT

Product Description: Municipal Water

Test Description: Endothall & Diquat

Sample Id: **S-0001081431**

Description: Municipal Water - 9/24/2014 09:00 EDT

Sampled Date: 09/24/2014

Received Date: 09/25/2014

Testing Parameter	Reporting Limit	Result	FDA SOQ	Units	P / F
Organic Chemicals					
Diquat (Ref: EPA 549.2)					
Diquat	0.4	ND	20	ug/L	Pass
Endothall (Ref: EPA 548.1) - (ug/L)					
Endothall	9	ND	100	ug/L	Pass



**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
LF37360

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	09/09/2014 12:45
Sample Point:	LAB TAP	Date Received:	09/10/2014 09:53
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 #
EDB and DBCP by GC						
1,2 Dibromo-3-chloropropane	Not Detected	09/12/2014	0.00002	0.0002	EPA 504.1	96-12-8
1,2 Dibromoethane	Not Detected	09/12/2014	0.00002	0.00005	EPA 504.1	106-93-4

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

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

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

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

**NSF International**

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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 07-OCT-2014**

Customer Name	City of Flint, Municipality
Tested To	EPA_DWR
Description	Qtr 3 - Water Sample <i>Run</i>
Test Type	Test only
Job Number	J-00142264
Project Number	9329404 (CL02)
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 Levanseler
Kerri Levanseler - Director, Chemistry Laboratory

Date 07-OCT-2014

**General Information**

Standard: EPA_DWR

Date and Time Sampled: 9/18/2014 08:15 EDT

Product Description: Qtr 3 - Water Sample

Sample Id: **S-0001079911**

Description: Qtr 3 - Water Sample - 9/18/2014 08:15 EDT

Sampled Date: 09/18/2014

Received Date: 09/19/2014

Testing Parameter	Reporting Limit	Result	Units
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Radiologicals

Radium-226	1	ND	pCi/L
Radium-226, Radium-228 Combined	1	ND	pCi/L
Radium-228	1	ND	pCi/L
P1 Gross Alpha	3	ND	pCi/L
P1 Gross Beta	4	ND	pCi/L

**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
LF39275**

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	09/17/2014 11:40
Sample Point:	PS4 WELL	Date Received:	09/19/2014 11:17
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	3.30	09/23/2014	0.5		SM 5310C	TOC-00-C

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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 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
LF39274

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: RAW WATER INTAKE
Water System: Public System Surface Water

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 09/17/2014 10:45
Date Received: 09/19/2014 11:17
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	3.26	09/23/2014	0.5		SM 5310C	TOC-00-C

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

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

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

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



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

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

Sample Number
LF40548

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	09/25/2014 09:35
Sample Point:	RAW-WATER INTAKE	Date Received:	09/26/2014 08:28
Water System:	Public System Surface Water	Purpose:	Routine Monitoring

PSH Well
Per Mike Glasgow

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	3.30	09/30/2014	0.5		SM 5310C	TOC-00-C

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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**

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

**Sample Number
LF40547**

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	09/25/2014 09:30
Sample Point:	PS4 WELL, Raw Water Intake	Date Received:	09/26/2014 08:28
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

Per Mike Glasgow

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	7.36	09/30/2014	0.5		SM 5310C	TOC-00-C

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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

General Information

Standard: USFDA CFR Title 21 Part 165.110

Date and Time Sampled: 9/24/2014 09:05 EDT

Product Description: Municipal Water

Test Description: Bromate - September

Sample Id: S-0001081432

Description: Municipal Water - 9/24/2014 09:05 EDT

Sampled Date: 09/24/2014

Received Date: 09/25/2014

Testing Parameter	Reporting Limit	Result	FDA SOQ	Units	P / F
Disinfection Residuals/Disinfection By-Products					
Bromate	5	9	10	ug/L	Pass

**NSF International**789 N. Dixboro Rd. Ann Arbor, MI 48105, USA
1-800.NSF.MARK | +1-734.769.8010 | www.nsf.org

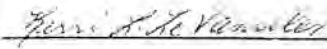
TEST REPORT

Send To: C0211289Mr. 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 01-OCT-2014**

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-00148747
Project Number	9841598 (CL01)
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 Levanseler - Director, Chemistry Laboratory**Date 01-OCT-2014**

**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

LF34168

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3606 CORUNNA RD, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM SINK
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: SITE 34 - DBP #4
Collector: Public Water Supply Operator
Date Collected: 08/21/2014 12:13
Date Received: 08/21/2014 15:03
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.006	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.007	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.024	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.011	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.058	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0033	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.026	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.094	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1813	08/25/2014	0.0005	0.080	EPA 524.2	TTMH-00-C

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**Genesee County Health Dept.
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 Pieper
Systems Mgmt. Unit Mgr: George Krisztian



Michigan Department of Environmental Quality

*Replicate Laboratory Report for
Lansing Drinking Water Laboratory*Owner/Location Information:CITY OF FLINT
2501 FLUSHING RD
FLINT MI 48504

Sample Number: LLF34167

Sample/Collection Information:WSSN: 02310
County: Genesee
Township:
Section:
Well #:
Collection Date: 8/21/2014 11:33:00 AM
Arrival Date: 8/21/2014 3:03:51 PMSite Code: SITE #5 - DBP #5
Water Source: Public Community Water Supply
Sample Reason: Routine Monitoring
Sample Point: Treated Public Distribution System
Point Description: KITCHEN SI
Collector: Public Water Supply Operator
Collected By: KEVIN MC LEOD

<u>CasNo</u>	<u>Analyte</u>	<u>Result</u>	<u>Detect</u>	<u>Units</u>	<u>Method</u>
79-08-3	BROMOACETIC ACID	ND	0.001	mg/L	EPA 552.1/552.2
5589-96-3	BROMOCHLOROACETIC ACID	0.001	0.001	mg/L	EPA 552.1/552.2
79-11-8	CHLOROACETIC ACID	ND	0.002	mg/L	EPA 552.1/552.2
75-99-0	DALAPON	ND	0.001	mg/L	EPA 552.1/552.2
631-64-1	DIBROMOACETIC ACID	ND	0.001	mg/L	EPA 552.1/552.2
79-43-6	DICHLOROACETIC ACID	0.006	0.001	mg/L	EPA 552.1/552.2
THA-00-C	TOTAL HALOACETIC ACID (FIVE)	0.017	NA	mg/L	EPA 552.1/552.2
76-03-9	TRICHLOROACETIC ACID	0.011	0.001	mg/L	EPA 552.1/552.2
75-25-2	BROMOFORM	0.0032	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.027	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.111	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.055	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.1962	0.0005	mg/L	EPA 524.2

Laboratory Comments:

Quality control results were outside allowed limits due to matrix interferences.

By authority of PA 368 of 1978 as amended.

Print Date: Tue Sep 2 16:00:18 EDT
2014

**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
LF34174

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:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/19/2014 12:30
Sample Point:	PS4 (3MG WELL)	Date Received:	08/21/2014 15:04
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	4.06	08/21/2014	0.5		SM 5310C	TOC-00-C

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

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

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LF34175

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: RAW WATER INTAKE
Water System: Public System Surface Water

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 08/19/2014 12:37
Date Received: 08/21/2014 15:04
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	8.48	08/21/2014	0.5		SM 5310C	TOC-00-C

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LF34165

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:	822 S DORT HWY, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	SITE #2 - DBP #2
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/21/2014 10:45
Sample Point:	BATHROOM SINK	Date Received:	08/21/2014 15:03
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.008	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.007	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	0.001	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.003	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.016	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.040	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.014	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.031	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0020	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.016	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.063	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1120	08/25/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

**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
LF34171

Official Laboratory Report

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

System Name/Owner:		WSSN/Pool ID:	2310
Collection Address:	3216 M L KING BLVD, FLINT	Source:	TYPE I
Collected By:	KEVIN MC LEOD	Site Code:	SITE #6 - DBP #6
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/21/2014 11:05
Sample Point:	BATHROOM SINK	Date Received:	08/21/2014 15:03
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.005	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.025	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.014	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.035	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0024	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.016	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.059	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1124	08/25/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF34169



Official Laboratory Report

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

System Name/Owner: **CITY OF FLINT**
Collection Address: **6204 N SAGINAW ST, FLINT**
Collected By: **KEVIN MC LEOD**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **BATHROOM SINK**
Water System: **Treated Public Distribution System**

WSSN/Pool ID: **2310**
Source: **TYPE I**
Site Code: **SITE #8 - DBP #8**
Collector: **Public Water Supply Operator**
Date Collected: **08/21/2014 10:25**
Date Received: **08/21/2014 15:03**
Purpose: **Routine Monitoring**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.009	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.006	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.018	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.037	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.009	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.036	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0023	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.016	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.064	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1183	08/25/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LF34164



Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3302 S DORT HWY, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN SINK
Water System: Other

WSSN/Pool ID: 2310
Source: Other
Site Code: SITE #3 - DBP #3
Collector: Public Water Supply Operator
Date Collected: 08/21/2014 11:00
Date Received: 08/21/2014 15:03
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.005	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.007	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.031	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.019	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.034	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0022	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.018	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.073	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1272	08/25/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LF34172

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 1416 DUPONT ST, FLINT
Collected By: KEVIN MC LEOD
Township/Well#/Section: //
County: Genesee
Sample Point: RESERVOIR SAMPLE TAP
Water System: Public System Well

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 08/21/2014 11:18
Date Received: 08/21/2014 15:04
Purpose: Water Quality Problem

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Trihalomethanes						
Bromodichloromethane	0.037	08/26/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0024	08/26/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.019	08/26/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.076	08/26/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1344	08/26/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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Genesee County Health Dept.
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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



**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
LF34170

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:	5018 CLIO RD, FLINT	Source:	TYPE I
Collected By:	KEVIN MC LEOD	Site Code:	SITE #7 - DBP #7
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/21/2014 10:45
Sample Point:	BATHROOM SINK	Date Received:	08/21/2014 15:03
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.006	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.001	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.009	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.030	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.014	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.041	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0024	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.019	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.082	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1444	08/25/2014	0.0005	0.080	EPA 524.2	THM-00-C

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Genesee County Health Dept.
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 Pieper
Systems Mgmt. Unit Mgr: George Knsztian



Michigan Department of Environmental Quality

Replicate Laboratory Report for Lansing Drinking Water Laboratory

Owner/Location Information:

CITY OF FLINT
3719 DAVISON RD
FLINT MI 48506

Sample Number: LLF34166

Sample/Collection Information:

WSSN: 02310
County: Genesee
Township:
Section:
Well #:
Collection Date: 8/21/2014 9:53:00 AM
Arrival Date: 8/21/2014 3:03:51 PM

Site Code: SITE #1 - DBP #1
Water Source: Public Community Water Supply
Sample Reason: Routine Monitoring
Sample Point: Treated Public Distribution System
Point Description: KITCHEN SI
Collector: Public Water Supply Operator
Collected By: CHRIS BEATENHEAD

CasNo	Analyte	Result	Detect	Units	Method
79-08-3	BROMOACETIC ACID	ND	0.001	mg/L	EPA 552.1/552.2
5589-96-3	BROMOCHLOROACETIC ACID	0.006	0.001	mg/L	EPA 552.1/552.2
79-11-8	CHLOROACETIC ACID	0.007	0.002	mg/L	EPA 552.1/552.2
75-99-0	DALAPON	0.002	0.001	mg/L	EPA 552.1/552.2
631-64-1	DIBROMOACETIC ACID	0.002	0.001	mg/L	EPA 552.1/552.2
79-43-6	DICHLOROACETIC ACID	0.013	0.001	mg/L	EPA 552.1/552.2
THA-00-C	TOTAL HALOACETIC ACID (FIVE)	0.043	NA	mg/L	EPA 552.1/552.2
76-03-9	TRICHLOROACETIC ACID	0.021	0.001	mg/L	EPA 552.1/552.2
75-25-2	BROMOFORM	0.0023	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.020	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.084	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.039	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.1453	0.0005	mg/L	EPA 524.2

Laboratory Comments:

Additional volatile organic compound(s) were detected. For quantitation and confirmation request analysis for CXVO.

By authority of PA 368 of 1978 as amended.

Print Date: Tue Sep 2 15:59:59 EDT
2014

*3rd Qtr DBP₂
(2nd Qtr from plant)
+ Reservoir TTHMs
d TDC
COPIES*



Michigan Department of Environmental Quality

*Replicate Laboratory Report for
Lansing Drinking Water Laboratory*Owner/Location Information:CITY OF FLINT
1100 CEDAR ST
FLINT MI 48503

Sample Number: LLF34173

Sample/Collection Information:

WSSN: 02310

County: Genesee

Township:

Section:

Well #:

Collection Date: 8/21/2014 11:44:00 AM

Arrival Date: 8/21/2014 3:04:06 PM

Site Code:

Water Source: Public Community Water Supply

Sample Reason: Water Quality Problem

Sample Point: Public System Well

Point Description: RESERVOIR

Collector: Public Water Supply Operator

Collected By: CHRIS BEATENHEAD

<u>CasNo</u>	<u>Analyte</u>	<u>Result</u>	<u>Detect</u>	<u>Units</u>	<u>Method</u>
75-25-2	BROMOFORM	0.0033	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.025	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.080	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.055	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.1633	0.0005	mg/L	EPA 524.2

Laboratory Comments:

Results do not agree between vials. The concentration of chloroform was above the calibrated level of the instrument (80 ppb).

By authority of PA 368 of 1978 as amended.

Print Date: Tue Sep 2 16:01:16 EDT
2014



Michigan Department of Environmental Quality

Replicate Laboratory Report for Lansing Drinking Water Laboratory

Owner/Location Information:

CITY OF FLINT
3606 CORUNNA RD
FLINT MI 48532

Sample Number: LLF34168

Sample/Collection Information:

WSSN: 02310

County: Genesee

Township:

Section:

Well #:

Collection Date: 8/21/2014 12:13:00 PM

Arrival Date: 8/21/2014 3:03:52 PM

Site Code: SITE 34 - DBP #4

Water Source: Public Community Water Supply

Sample Reason: Routine Monitoring

Sample Point: Treated Public Distribution System

Point Description: BATHROOM S

Collector: Public Water Supply Operator

Collected By: CHRIS BEATENHEAD

CasNo	Analyte	Result	Detect	Units	Method
79-08-3	BROMOACETIC ACID	ND	0.001	mg/L	EPA 552.1/552.2
5589-96-3	BROMOCHLOROACETIC ACID	0.002	0.001	mg/L	EPA 552.1/552.2
79-11-8	CHLOROACETIC ACID	0.006	0.002	mg/L	EPA 552.1/552.2
75-99-0	DALAPON	ND	0.001	mg/L	EPA 552.1/552.2
631-64-1	DIBROMOACETIC ACID	ND	0.001	mg/L	EPA 552.1/552.2
79-43-6	DICHLOROACETIC ACID	0.007	0.001	mg/L	EPA 552.1/552.2
THA-00-C	TOTAL HALOACETIC ACID (FIVE)	0.024	NA	mg/L	EPA 552.1/552.2
76-03-9	TRICHLOROACETIC ACID	0.011	0.001	mg/L	EPA 552.1/552.2
75-25-2	BROMOFORM	0.0033	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.026	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.094	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.058	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.1813	0.0005	mg/L	EPA 524.2

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Tue Sep 2 16:00:35 EDT
2014

**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

LF34171

Official Laboratory Report

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

System Name/Owner:
Collection Address: 3216 M L KING BLVD, FLINT
Collected By: KEVIN MC LEOD
Township/Well#/Section: //
County: Genesee
Sample Point: BATHROOM SINK
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: SITE #6 - DBP #6
Collector: Public Water Supply Operator
Date Collected: 08/21/2014 11:05
Date Received: 08/21/2014 15:03
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.005	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.025	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.014	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.035	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0024	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.016	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.059	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1124	08/25/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

COMPLETED

**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
LF34164

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3302 S DORT HWY, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN SINK
Water System: Other

WSSN/Pool ID: 2310
Source: Other
Site Code: SITE #3 - DBP #3
Collector: Public Water Supply Operator
Date Collected: 08/21/2014 11:00
Date Received: 08/21/2014 15:03
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.005	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.007	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.031	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.019	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.034	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0022	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.018	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.073	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1272	08/25/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

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



Sample Number
LF34169

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:	6204 N SAGINAW ST, FLINT	Source:	TYPE I
Collected By:	KEVIN MC LEOD	Site Code:	SITE #8 - DBP #8
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/21/2014 10:25
Sample Point:	BATHROOM SINK	Date Received:	08/21/2014 15:03
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.009	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.006	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.018	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.037	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.009	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.036	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0023	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.016	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.064	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1183	08/25/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

COMPLETED

**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

LF34166

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3719 DAVISON RD, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN SINK
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: SITE #1 - DBP #1
Collector: Public Water Supply Operator
Date Collected: 08/21/2014 09:53
Date Received: 08/21/2014 15:03
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.006	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.007	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	0.002	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.013	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.043	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.021	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.039	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0023	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.020	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.084	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1453	08/25/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

Additional volatile organic compound(s) were detected. For quantitation and confirmation request analysis for CXVO.

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

LF34167

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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

LF34170

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:	5018 CLIO RD, FLINT	Source:	TYPE I
Collected By:	KEVIN MC LEOD	Site Code:	SITE #7 - DBP #7
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/21/2014 10:45
Sample Point:	BATHROOM SINK	Date Received:	08/21/2014 15:03
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.006	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.001	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.009	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.030	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.014	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.041	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0024	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.019	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.082	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1444	08/25/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

COMPLETED

**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
LF34165

Official Laboratory Report

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

System Name/Owner: **CITY OF FLINT**
Collection Address: **822 S DORT HWY, FLINT**
Collected By: **CHRIS BEATENHEAD**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **BATHROOM SINK**
Water System: **Treated Public Distribution System**

WSSN/Pool ID: **2310**
Source: **TYPE I**
Site Code: **SITE #2 - DBP #2**
Collector: **Public Water Supply Operator**
Date Collected: **08/21/2014 10:45**
Date Received: **08/21/2014 15:03**
Purpose: **Routine Monitoring**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.008	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.007	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	0.001	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.003	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.016	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.040	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.014	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.031	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0020	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.016	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.063	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1120	08/25/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

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



Sample Number
LF34169

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:	6204 N SAGINAW ST, FLINT	Source:	TYPE I
Collected By:	KEVIN MC LEOD	Site Code:	SITE #8 - DBP #8
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/21/2014 10:25
Sample Point:	BATHROOM SINK	Date Received:	08/21/2014 15:03
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.009	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.006	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.018	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.037	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.009	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.036	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0023	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.016	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.064	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1183	08/25/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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Genesee County Health Dept.
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 Pieper
Systems Mgmt. Unit Mgr: George Krisztian

COMPLETED



**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
LF34166

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 3719 DAVISON RD, FLINT
Collected By: CHRIS BEATENHEAD
Township/Well#/Section: //
County: Genesee
Sample Point: KITCHEN SINK
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code: SITE #1 - DBP #1
Collector: Public Water Supply Operator
Date Collected: 08/21/2014 09:53
Date Received: 08/21/2014 15:03
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/23/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.006	08/23/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	0.007	08/23/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	0.002	08/23/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	08/23/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.013	08/23/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.043	08/23/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.021	08/23/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.039	08/25/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0023	08/25/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.020	08/25/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.084	08/25/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1453	08/25/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

Additional volatile organic compound(s) were detected. For quantitation and confirmation request analysis for CXVO.

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

LF34166



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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

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

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

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Systems Mgmt. Unit Mgr: George Krisztian

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Lansing, MI 48909

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FAX: (517) 335-8562



Sample Number

LF34175

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: RAW WATER INTAKE
Water System: Public System Surface Water

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 08/19/2014 12:37
Date Received: 08/21/2014 15:04
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	8.48	08/21/2014	0.5		SM 5310C	TOC-00-C

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



Sample Number
LF34174

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: PS4 (3MG WELL)
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 08/19/2014 12:30
Date Received: 08/21/2014 15:04
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	4.06	08/21/2014	0.5		SM 5310C	TOC-00-C

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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

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Sample Number

LF34173

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:	1100 CEDAR ST, FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/21/2014 11:44
Sample Point:	RESERVOIR SAMPLE TAP - CEDAR ST	Date Received:	08/21/2014 15:04
Water System:	Public System Well	Purpose:	Water Quality Problem

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Trihalomethanes						
Bromodichloromethane	0.055	08/26/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0033	08/26/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.025	08/26/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.080	08/26/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1633	08/26/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

Results do not agree between vials. The concentration of chloroform was above the calibrated level of the instrument (80 ppb)

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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AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
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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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DRINKING WATER LABORATORY**

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

Sample Number
LF34172

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT
Collection Address: 1416 DUPONT ST, FLINT
Collected By: KEVIN MC LEOD
Township/Well#/Section: //
County: Genesee
Sample Point: RESERVOIR SAMPLE TAP
Water System: Public System Well

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 08/21/2014 11:18
Date Received: 08/21/2014 15:04
Purpose: Water Quality Problem

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Trihalomethanes						
Bromodichloromethane	0.037	08/26/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0024	08/26/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.019	08/26/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.076	08/26/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1344	08/26/2014	0.0005	0.080	EPA 524.2	TTM-00-C

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

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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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FAX: (517) 335-8562



Sample Number
LF31222

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:	CITY OF FLINT WATER PLANT, FLINT	Source:	Other
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/06/2014 14:30
Sample Point:	PLANT TAP	Date Received:	08/06/2014 16:23
Water System:	Other	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	08/08/2014	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	08/08/2014	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.03	08/08/2014	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	08/08/2014	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	08/08/2014	0.0003	0.005	EPA 200.8	7440-43-9
Chloride	61	08/07/2014	4		SM 4500-Cl E	7647-14-5
Chromium	Not detected	08/08/2014	0.01	0.1	EPA 200.8	7440-47-3
Fluoride	0.70	08/07/2014	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO ₃	155	08/07/2014	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	08/07/2014	0.1		SM 3500 FeB	7439-89-6
Lead	Not detected	08/08/2014	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not Detected	08/08/2014	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	08/08/2014	0.01	0.1	EPA 200.8	7440-02-0
Nitrate as N	0.5	08/07/2014	0.4	10	10-107-04-2-B	14797-55-8
Nitrite as N	Not detected	08/07/2014	0.05	1	10-107-04-2-B	14797-65-0
Selenium	0.001	08/08/2014	0.001	0.05	EPA 200.8	7782-49-2
Sodium (automated)	16	08/07/2014	5		SM 3500 NaB	7440-23-5
Sulfate	23	08/07/2014	10		SM 4500 SO ₄ E	14808-79-8
Thallium	Not detected	08/08/2014	0.0002	0.002	EPA 200.8	7440-28-0
Carbamates by HPLC						
3 Hydroxycarbofuran	Not Detected	08/08/2014	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	08/08/2014	0.0005		EPA 531.2	116-06-3

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

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FAX: (517) 335-8562



Sample Number
LF31222

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Carbamates by HPLC						
Aldicarb sulfone	Not Detected	08/08/2014	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	08/08/2014	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	08/08/2014	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	08/08/2014	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	08/08/2014	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	08/08/2014	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	08/08/2014	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	08/08/2014	0.001		EPA 531.2	114-26-1
Chlorinated Acid Herbicides						
2,4,5-T	Not Detected	08/12/2014	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	08/12/2014	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	08/12/2014	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	08/12/2014	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	08/12/2014	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	08/12/2014	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	08/12/2014	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	08/12/2014	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	08/12/2014	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	08/12/2014	0.001		EPA 515.4	1861-32-1
Pesticides Analysis by GC/MS						
4,4'-DDD	Not Detected	08/11/2014	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	08/11/2014	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	08/11/2014	0.0005		EPA 525.2	50-29-3
Acetochlor	Not Detected	08/11/2014	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	08/11/2014	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	08/11/2014	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	08/11/2014	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	0.0003	08/11/2014	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	08/11/2014	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	08/11/2014	0.0001	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	08/11/2014	0.001		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	08/11/2014	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	08/11/2014	0.0002	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	08/11/2014	0.0001	0.0002	EPA 525.2	1024-57-3
Hexachlorobenzene	Not Detected	08/11/2014	0.0001	0.001	EPA 525.2	118-74-1
Hexachlorocyclohexane (alpha-BHC)	Not Detected	08/11/2014	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	08/11/2014	0.001		EPA 525.2	319-85-7

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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

**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

LF31222

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Pesticides Analysis by GC/MS						
Hexachlorocyclohexane (delta-BHC)	Not Detected	08/11/2014	0.001		EPA 525.2	319-86-8
Hexachlorocyclopentadiene	Not Detected	08/11/2014	0.0005	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	08/11/2014	0.0001	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	08/11/2014	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	08/11/2014	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	08/11/2014	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	08/11/2014	0.0005		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	08/11/2014	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1221)	Not Detected	08/11/2014	0.0001	0.0005	EPA 525.2	11104-28-2
PCB (aroclor 1232)	Not Detected	08/11/2014	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	08/11/2014	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	08/11/2014	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	08/11/2014	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	08/11/2014	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	08/11/2014	0.0001		EPA 525.2	59536-65-1
Simazine	Not Detected	08/11/2014	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	08/11/2014	0.001	0.003	EPA 525.2	8001-35-2
Volatile Organic Compounds						
1,1 Dichloroethane	Not Detected	08/08/2014	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	08/08/2014	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	08/08/2014	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	08/08/2014	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	08/08/2014	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	08/08/2014	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	08/08/2014	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	08/08/2014	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	08/08/2014	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	08/08/2014	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	08/08/2014	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	08/08/2014	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	08/08/2014	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	08/08/2014	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	08/08/2014	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	08/08/2014	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	08/08/2014	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	08/08/2014	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichloropropane	Not Detected	08/08/2014	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	08/08/2014	0.0005	0.005	EPA 524.2	71-43-2

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Sample Number

LF31222

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Bromobenzene	Not Detected	08/08/2014	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	08/08/2014	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.024	08/08/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0018	08/08/2014	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	08/08/2014	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	08/08/2014	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	08/08/2014	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.015	08/08/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	08/08/2014	0.0005		EPA 524.2	75-00-3
Chloroform	0.045	08/08/2014	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	08/08/2014	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	08/08/2014	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	08/08/2014	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	08/08/2014	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	08/08/2014	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	08/08/2014	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	08/08/2014	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	08/08/2014	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	08/08/2014	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	08/08/2014	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	08/08/2014	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	08/08/2014	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	08/08/2014	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	08/08/2014	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	08/08/2014	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	08/08/2014	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	08/08/2014	0.01		EPA 524.2	98-95-3
n-Propylbenzene	Not Detected	08/08/2014	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	08/08/2014	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	08/08/2014	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	08/08/2014	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	08/08/2014	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	08/08/2014	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	08/08/2014	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	08/08/2014	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	08/08/2014	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	08/08/2014	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	08/08/2014	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.086	08/08/2014	NA	0.080	EPA 524.2	TTHM-00-C

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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
LF31222

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Total Xylenes	Not Detected	08/08/2014	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	08/08/2014	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	08/08/2014	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	08/08/2014	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	08/08/2014	0.0004	0.002	EPA 524.2	75-01-4

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

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

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

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

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Sample Number
LF27718

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	4500 N DORT HWY, FLINT	Source:	Surface Water
Collected By:	MICHAEL GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Other
County:	Genesee	Date Collected:	07/15/2014 14:21
Sample Point:	RAW WATER INTAKE	Date Received:	07/17/2014 08:23
Water System:	Other	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	8.44	07/17/2014	0.5		SM 5310C	TOC-00-C

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June Aik Avg 1 223 ppm > 120
SD 446 TAC > 8.0 - must meet 30% reduction
% ↓ $\frac{5.25}{8.44} = 68\%$

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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 Krisztian

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



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Lansing, MI 48909
TEL: (517) 335-8184
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Sample Number
LF27717

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	PS4 WELL, FLINT	Source:	TYPE I
Collected By:	MICHAEL GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	07/15/2014 14:15
Sample Point:	SAMPLE SINK	Date Received:	07/17/2014 08:23
Water System:	Public System Well	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Total Organic Carbon	2.67	07/17/2014	0.5		SM 5310C	TOC-00-C

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Genesee County Health Dept.
630 South Saginaw
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Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

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Sample Number
LF19426

Official Laboratory Report

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

System Name/Owner:	B & P GAS STATION	WSSN/Pool ID:	2310
Collection Address:	822 S DORT HWY, FLINT	Source:	TYPE I
Collected By:	NICOLE ALEXANDER	Site Code:	DBP5
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/21/2014 10:56
Sample Point:	SINK	Date Received:	05/22/2014 13:18
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/30/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.010	05/30/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/30/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/30/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.003	05/30/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.018	05/30/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.038	05/30/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.017	05/30/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.027	05/27/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0011	05/27/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.014	05/27/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.033	05/27/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0751	05/27/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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Sample Number
LF19422

Official Laboratory Report

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

*DBP
Entered ✓*

System Name/Owner:	MCDONALDS	WSSN/Pool ID:	2310
Collection Address:	3719 DAVISON RD, FLINT	Source:	TYPE I
Collected By:	MICHAEL GLASGOW	Site Code:	DBP1
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/21/2014 09:28
Sample Point:	SINK	Date Received:	05/22/2014 13:18
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/30/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.016	05/30/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/30/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/30/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.005	05/30/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.036	05/30/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.064	05/30/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.023	05/30/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.045	05/23/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0014	05/23/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.019	05/23/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.097	05/23/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1624	05/23/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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**Sample Number
LF19423**

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4500 N DORT HWY
FLINT MI 48505

System Name/Owner:	LIQUOR PALACE	WSSN/Pool ID:	2310
Collection Address:	3302 S DORT HWY, FLINT	Source:	TYPE I
Collected By:	NICOLE ALEXANDER	Site Code:	DBP2
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/21/2014 11:06
Sample Point:	SINK	Date Received:	05/22/2014 13:18
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/30/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.012	05/30/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/30/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/30/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.003	05/30/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.026	05/30/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.052	05/30/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.023	05/30/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.036	05/23/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0016	05/23/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.019	05/23/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.055	05/23/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1116	05/23/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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



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

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

Sample Number
LF19425

Official Laboratory Report

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

System Name/Owner:	UNIVERSITY MARKET	WSSN/Pool ID:	2310
Collection Address:	2501 FLUSHING RD, FLINT	Source:	TYPE I
Collected By:	NICOLE ALEXANDER	Site Code:	DBP4
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/21/2014 11:37
Sample Point:	SINK	Date Received:	05/22/2014 13:18
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/30/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.013	05/30/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/30/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/30/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	05/30/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.026	05/30/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.055	05/30/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.025	05/30/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.035	05/23/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0014	05/23/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.017	05/23/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.053	05/23/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.1064	05/23/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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



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

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

Sample Number
LF19424

Official Laboratory Report

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

System Name/Owner:	NORTH FLINT AUTOMOTIVE	WSSN/Pool ID:	2310
Collection Address:	6204 N SAGINAW ST, FLINT	Source:	TYPE I
Collected By:	NICOLE ALEXANDER	Site Code:	DBP3
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/21/2014 12:16
Sample Point:	SINK	Date Received:	05/22/2014 13:18
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/30/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.012	05/30/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/30/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/30/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	05/30/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.023	05/30/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.048	05/30/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.021	05/30/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.033	05/23/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0015	05/23/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.018	05/23/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.044	05/23/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0965	05/23/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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



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

Sample Number
LF19428

Official Laboratory Report

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

System Name/Owner:	KROGER	WSSN/Pool ID:	2310
Collection Address:	5018 CLIO RD, FLINT	Source:	TYPE I
Collected By:	NICOLE ALEXANDER	Site Code:	DBP7
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/21/2014 12:04
Sample Point:	SINK	Date Received:	05/22/2014 13:18
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/30/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.012	05/30/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/30/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/30/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	05/30/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.024	05/30/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.049	05/30/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.021	05/30/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.030	05/27/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0012	05/27/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.015	05/27/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.042	05/27/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0882	05/27/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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



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

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

Sample Number
LF19427

Official Laboratory Report

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

System Name/Owner:	SALEM HOUSING	WSSN/Pool ID:	2310
Collection Address:	3216 MLK BLVD, FLINT	Source:	TYPE I
Collected By:	NICOLE ALEXANDER	Site Code:	DBP6 7
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/21/2014 11:52
Sample Point:	SINK	Date Received:	05/22/2014 13:18
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/30/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.011	05/30/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/30/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/30/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.003	05/30/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.020	05/30/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.041	05/30/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.018	05/30/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.027	05/27/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0012	05/27/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.015	05/27/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.039	05/27/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0822	05/27/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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



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

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

Sample Number
LF19429

Official Laboratory Report

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

System Name/Owner:	TACO BELL	WSSN/Pool ID:	2310
Collection Address:	3606 CORUNNA RD, FLINT	Source:	TYPE I
Collected By:	NICOLE ALEXANDER	Site Code:	DBP8
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/21/2014 11:25
Sample Point:	SINK	Date Received:	05/22/2014 13:18
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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/30/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.014	05/30/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/30/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/30/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	05/30/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.024	05/30/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.050	05/30/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.022	05/30/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.027	05/27/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0012	05/27/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.015	05/27/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.036	05/27/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0792	05/27/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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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



Live Safer™

NSF International789 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	18-JUL-2014
Customer Name	City of Flint, Municipality		
Tested To	EPA_DWR		
Description	Qtr 2 - Water Sample		
Test Type	Test only		
Job Number	J-00142263		
Project Number	9329404 (CL01)		
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 Levanseler**Date** 18-JUL-2014

Kerri Levanseler - Director, Chemistry Laboratory

**General Information**

Standard: EPA_DWR

Date and Time Sampled: 6/30/14 14:12 EDT

Product Description: Qtr 2 - Water Sample

Sample Id: S-0001052321
Description: Qtr 2 - Water Sample - 6/30/14 14:12 EDT
Sampled Date: 06/30/2014
Received Date: 07/01/2014

Testing Parameter	Reporting Limit	Result	Units
Radiologicals			
Radium-226	1	ND	pCi/L
Radium-226, Radium-228 Combined	1	ND	pCi/L
Radium-228	1	ND	pCi/L
P1 Gross Alpha	3	ND	pCi/L
P1 Gross Beta	4	ND	pCi/L



<<Additional Information>>

Sample Id: S-0001052321

Test Parameter	Date Analyzed	Time Analyzed	Date Prepared/ Processed
Radiologicals			
Total Radium-226, Radium-228 Combined Activity	17-JUL-2014		
Gross Alpha and Beta Radioactivity in Drinking Water (Ref: EPA 900.0)	7-JUL-2014		

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
C0842	Gross Alpha and Beta Radioactivity in Drinking Water (Ref: EPA 900.0)
C0980	Total Radium-226, Radium-228 Combined Activity

Certifications:

Michigan (# 0048)	Florida (# E-87752 FL)	California (# 03214 CA)
New York (# 11206)	Connecticut (# PH-0625)	New Jersey (# MI770)
South Carolina (# 81005)	Pennsylvania (# 68-00312)	Hawaii
Indiana	Maryland (# 201)	Nevada (# MI000302010A)
Virginia (# 00045)	Vermont (# VT 11206)	North Carolina (# 26701)
Arizona (# AZ0655)		

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: An ND result means that the contaminant was not detected at or above the detection limit for the instrument.

For a list of NSF International Method Detection Limits refer to
http://www.nsf.org/media/enews/documents/minimum_detection_level_spreadsheet.pdf.



**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
LF31223

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:	CITY OF FLINT WATER PLANT, FLINT	Source:	Other
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	08/06/2014 14:35
Sample Point:	PLANT SETTLER	Date Received:	08/06/2014 16:23
Water System:	Other	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Cyanide-Available	Not Detected	08/13/2014	0.02	0.2	QIA-1677	57-12-5

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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

*Replicate Laboratory Report for
Lansing Drinking Water Laboratory*Owner/Location Information:CITY OF FLINT
PS4 WELL
FLINT MI 48505

Sample Number: LLF27717

Sample/Collection Information:

WSSN: 02310

County: Genesee

Township:

Section:

Well #:

Collection Date: 7/15/2014 2:15:00 PM

Arrival Date: 7/17/2014 8:23:55 AM

Site Code:

Water Source: Public Community Water Supply

Sample Reason: Routine Monitoring

Sample Point: Public System Well

Point Description: SAMPLE SIN

Collector: Public Water Supply Operator

Collected By: MICHAEL GLASGOW

<u>CasNo</u>	<u>Analyte</u>	<u>Result</u>	<u>Detect</u>	<u>Units</u>	<u>Method</u>
TOC-00-C	TOTAL ORGANIC CARBON	2.67	0.5	mg/L	SM 5310C

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Tue Aug 26 11:15:31 EDT
2014



Michigan Department of Environmental Quality

*Replicate Laboratory Report for
Lansing Drinking Water Laboratory*Owner/Location Information:

CITY OF FLINT WATER PLANT
4500 N DORT HWY P S 4
FLINT MI 48505

Sample Number: LLF22685

Sample/Collection Information:

WSSN: 02510

County: Genesee

Township:

Section:

Well #:

Collection Date: 6/15/2014 11:50:00 AM

Arrival Date: 6/16/2014 3:00:21 PM

Site Code:

Water Source: Other

Sample Reason: Other

Sample Point: Other

Point Description: RAW WATER

Collector: Public Water Supply Operator

Collected By: NICOLE ALEXANDER

<u>CasNo</u>	<u>Analyte</u>	<u>Result</u>	<u>Detect</u>	<u>Units</u>	<u>Method</u>
TOC-00-C	TOTAL ORGANIC CARBON	9.00	0.5	mg/L	SM 5310C

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Mon Jul 21 08:36:32 EDT
2014



Michigan Department of Environmental Quality

*Replicate Laboratory Report for
Lansing Drinking Water Laboratory*Owner/Location Information:

CITY OF FLINT WATER PLANT
4500 DORT HWY P.S.4
FLINT MI 48505

Sample Number: LLF22686

Sample/Collection Information:

WSSN: 12-000

County: Genesee

Township:

Section:

Well #:

Collection Date: 6/15/2014 11:50:00 AM

Arrival Date: 6/16/2014 3:00:26 PM

Site Code:

Water Source: Other

Sample Reason: Other

Sample Point: Other

Point Description: P.S.4 PUMP

Collector: Public Water Supply Operator

Collected By: NICOLE ALEXANDER

<u>CasNo</u>	<u>Analyte</u>	<u>Result</u>	<u>Detect</u>	<u>Units</u>	<u>Method</u>
TOC-00-C	TOTAL ORGANIC CARBON	3.63	0.5	mg/L	SM 5310C

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Mon Jul 21 08:38:25 EDT
2014

**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
LF22684

Official Laboratory Report

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

System Name/Owner: CITY OF FLINT WATER PLANT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MICHAEL GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: LAB TAP
Water System: Treated Public Distribution System

WSSN/Pool ID: 02310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 06/16/2014 08:30
Date Received: 06/16/2014 15:00
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	06/18/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.008	06/18/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	06/18/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	06/18/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	06/18/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.019	06/18/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.036	06/18/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.013	06/18/2014	0.001		EPA 552.1/552.2	76-03-9

Quality control results were outside allowed limits due to matrix interferences.

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
LF22687

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT WATER PLANT	WSSN/Pool ID:	
Collection Address:	4500 N DORT HWY, FLINT	Source:	TYPE I
Collected By:	MICHAEL GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	06/16/2014 08:30
Sample Point:	LAB TAP	Date Received:	06/16/2014 15:00
Water System:	Treated Public Distribution System	Purpose:	Routine Monitoring

Sample Comment LF22687 Analysis canceled by submitter.

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
^^^ NOT TESTED^^^	Not Tested	06/17/2014				NOTST-00-C

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

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

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

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

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

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

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



Sample Number
LF09947

Official Laboratory Report

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

System Name/Owner: NORTH FLINT AUTO
Collection Address: 6204 N SAGINAW ST, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP3
Collector: Public Water Supply Operator
Date Collected: 02/19/2014 12:55
Date Received: 02/20/2014 12:28
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/26/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	02/26/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/26/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/26/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	02/26/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.003	02/26/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.008	02/26/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	02/26/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0040	02/20/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	02/20/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0020	02/20/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0040	02/20/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0100	02/20/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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**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
LF09948**

Official Laboratory Report

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

System Name/Owner:	UNIVERSITY MARKET	WSSN/Pool ID:	2310
Collection Address:	2501 FLUSHING RD, FLINT	Source:	TYPE III
Collected By:	NICOLE ALEXANDER	Site Code:	DBP4
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	02/19/2014 12:02
Sample Point:	SINK	Date Received:	02/20/2014 12:28
Water System:	Other	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/26/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	02/26/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/26/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/26/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	02/26/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	02/26/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.009	02/26/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	02/26/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0046	02/20/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	02/20/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0022	02/20/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0054	02/20/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0122	02/20/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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



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

Sample Number
LF09946

Official Laboratory Report

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

System Name/Owner: **LIQUOR PALACE**
Collection Address: **3302 S DORT HWY, FLINT**
Collected By: **NICOLE ALEXANDER**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **SINK**
Water System: **Other**

WSSN/Pool ID: **2310**
Source: **TYPE III**
Site Code: **DBP2**
Collector: **Public Water Supply Operator**
Date Collected: **02/19/2014 10:54**
Date Received: **02/20/2014 12:28**
Purpose: **Routine Monitoring**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/26/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	02/26/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/26/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/26/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	02/26/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	02/26/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.009	02/26/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	02/26/2014	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0044	02/20/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	02/20/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0021	02/20/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0046	02/20/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0111	02/20/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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

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



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

**Sample Number
LF09945**

Official Laboratory Report

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

System Name/Owner: **MCDONALDS**
Collection Address: **3719 DAVISON RD, FLINT**
Collected By: **MICHAEL GLASGOW**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **SINK**
Water System: **Other**

WSSN/Pool ID: **2310**
Source: **TYPE III**
Site Code: **DBP1**
Collector: **Public Water Supply Operator**
Date Collected: **02/19/2014 09:55**
Date Received: **02/20/2014 12:28**
Purpose: **Routine Monitoring**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/26/2014	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	02/26/2014	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/26/2014	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/26/2014	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	02/26/2014	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	02/26/2014	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.009	02/26/2014	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.004	02/26/2014	0.001		EPA 552.1/552.2	76-03-9

Quality control results were outside allowed limits due to matrix interferences.

Total Trihalomethanes						
Bromodichloromethane	0.0068	02/20/2014	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	02/20/2014	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0028	02/20/2014	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.015	02/20/2014	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0246	02/20/2014	0.0005	0.080	EPA 524.2	TTHM-00-C

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

LM



**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
LF09945

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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

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

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

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

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



Michigan Department of Environmental Quality

*Replicate Laboratory Report for
Lansing Drinking Water Laboratory*Owner/Location Information:MCDONALDS
3719 DAVISON RD
FLINT MI 48505

Sample Number: LLF02284

Sample/Collection Information:WSSN: 02310
County: Genesee
Township:
Section:
Well #:
Collection Date: 11/20/2013 9:12:00 AM
Arrival Date: 11/21/2013 12:21:12 PMSite Code: DBP1
Water Source: All Other Public Supplies
Sample Reason: Routine Monitoring
Sample Point: Other
Point Description: SINK
Collector: Public Water Supply Operator
Collected By: MICHAEL GLASGOW

CasNo	Analyte	Result	Detect	Units	Method
79-08-3	BROMOACETIC ACID	ND	0.001	mg/L	EPA 552.1/552.2
5589-96-3	BROMOCHLOROACETIC ACID	0.004	0.001	mg/L	EPA 552.1/552.2
79-11-8	CHLOROACETIC ACID	ND	0.002	mg/L	EPA 552.1/552.2
75-99-0	DALAPON	ND	0.001	mg/L	EPA 552.1/552.2
631-64-1	DIBROMOACETIC ACID	0.001	0.001	mg/L	EPA 552.1/552.2
79-43-6	DICHLOROACETIC ACID	0.010	0.001	mg/L	EPA 552.1/552.2
THA-00-C	TOTAL HALOACETIC ACID (FIVE)	0.019	NA	mg/L	EPA 552.1/552.2
76-03-9	TRICHLOROACETIC ACID	0.008	0.001	mg/L	EPA 552.1/552.2
75-25-2	BROMOFORM	ND	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.0030	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.017	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.0075	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.0275	0.0005	mg/L	EPA 524.2

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Thu Feb 13 13:22:50 EST
2014



Michigan Department of Environmental Quality

Replicate Laboratory Report for Lansing Drinking Water Laboratory

Owner/Location Information:

LIQUOR PALACE
3302 S DORT HWY
FLINT MI

Sample Number: LLF02285

Sample/Collection Information:

WSSN: 02310
County: Genesee
Township
Section:
Well #:
Collection Date: 11/20/2013 11:25:00 AM
Arrival Date: 11/21/2013 12:21:13 PM

Site Code: DBP2
Water Source: All Other Public Supplies
Sample Reason: Routine Monitoring
Sample Point: Other
Point Description: SINK
Collector: Public Water Supply Operator
Collected By: NICOLE ALEXANDER

CasNo	Analyte	Result	Detect	Units	Method
79-08-3	BROMOACETIC ACID	ND	0.001	mg/L	EPA 552.1/552.2
5589-96-3	BROMOCHLOROACETIC ACID	0.003	0.001	mg/L	EPA 552.1/552.2
79-11-8	CHLOROACETIC ACID	ND	0.002	mg/L	EPA 552.1/552.2
75-99-0	DALAPON	ND	0.001	mg/L	EPA 552.1/552.2
631-64-1	DIBROMOACETIC ACID	ND	0.001	mg/L	EPA 552.1/552.2
79-43-6	DICHLOROACETIC ACID	0.006	0.001	mg/L	EPA 552.1/552.2
THA-00-C	TOTAL HALOACETIC ACID (FIVE)	0.014	NA	mg/L	EPA 552.1/552.2
76-03-9	TRICHLOROACETIC ACID	0.008	0.001	mg/L	EPA 552.1/552.2
75-25-2	BROMOFORM	ND	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.0025	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.0087	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.0060	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.0172	0.0005	mg/L	EPA 524.2

Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Thu Feb 13 13:23:06 EST
2014

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Michigan Department of Environmental Quality

Replicate Laboratory Report for Lansing Drinking Water Laboratory

Owner/Location Information:

UNIVERSITY MARKET
2501 FLUSHING RD
FLINT MI 48505

Sample Number: LLF02286

Sample/Collection Information:

WSSN: 02310

County: Genesee

Township:

Section

Well #:

Collection Date: 11/20/2013 12:19:00 PM

Arrival Date: 11/21/2013 12:21:13 PM

Site Code: DBP4

Water Source: All Other Public Supplies

Sample Reason: Routine Monitoring

Sample Point: Other

Point Description: SINK

Collector: Public Water Supply Operator

Collected By: NICOLE ALEXANDER

CasNo	Analyte	Result	Detect	Units	Method
79-08-3	BROMOACETIC ACID	ND	0.001	mg/L	EPA 552.1/552.2
5589-96-3	BROMOCHLOROACETIC ACID	0.003	0.001	mg/L	EPA 552.1/552.2
79-11-8	CHLOROACETIC ACID	ND	0.002	mg/L	EPA 552.1/552.2
75-99-0	DALAPON	ND	0.001	mg/L	EPA 552.1/552.2
631-64-1	DIBROMOACETIC ACID	ND	0.001	mg/L	EPA 552.1/552.2
79-43-6	DICHLOROACETIC ACID	0.004	0.001	mg/L	EPA 552.1/552.2
THA-00-C	TOTAL HALOACETIC ACID (FIVE)	0.012	NA	mg/L	EPA 552.1/552.2
76-03-9	TRICHLOROACETIC ACID	0.008	0.001	mg/L	EPA 552.1/552.2
75-25-2	BROMOFORM	ND	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.0027	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.010	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.0064	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.0191	0.0005	mg/L	EPA 524.2

Laboratory Comments:

By authority of PA 368 of 1978 as amended

Print Date: Thu Feb 13 13:23:13 EST
2014



Michigan Department of Environmental Quality

Replicate Laboratory Report for Lansing Drinking Water Laboratory

Owner/Location Information:

NORTH FLINT AUTO
6204 N SAGINAW ST
FLINT MI

Sample Number: LLF02287

Sample/Collection Information:

WSSN: 02310

County: Genesee

Township:

Section:

Well #:

Collection Date: 11/20/2013 1:05:00 PM

Arrival Date: 11/21/2013 12:21:13 PM

Site Code: DBP3

Water Source: All Other Public Supplies

Sample Reason: Routine Monitoring

Sample Point: Other

Point Description: SINK

Collector: Public Water Supply Operator

Collected By: NICOLE ALEXANDER

CasNo	Analyte	Result	Detect	Units	Method
79-08-3	BROMOACETIC ACID	ND	0.001	mg/L	EPA 552.1/552.2
5589-96-3	BROMOCHLOROACETIC ACID	0.004	0.001	mg/L	EPA 552.1/552.2
79-11-8	CHLOROACETIC ACID	ND	0.002	mg/L	EPA 552.1/552.2
75-99-0	DALAPON	ND	0.001	mg/L	EPA 552.1/552.2
631-64-1	DIBROMOACETIC ACID	0.001	0.001	mg/L	EPA 552.1/552.2
79-43-6	DICHLOROACETIC ACID	0.006	0.001	mg/L	EPA 552.1/552.2
THA-00-C	TOTAL HALOACETIC ACID (FIVE)	0.015	NA	mg/L	EPA 552.1/552.2
76-03-9	TRICHLOROACETIC ACID	0.008	0.001	mg/L	EPA 552.1/552.2
75-25-2	BROMOFORM	ND	0.0005	mg/L	EPA 524.2
124-48-1	CHLORODIBROMOMETHANE	0.0027	0.0005	mg/L	EPA 524.2
67-66-3	CHLOROFORM	0.0084	0.0005	mg/L	EPA 524.2
75-27-4	DICHLOROBROMOMETHANE	0.0059	0.0005	mg/L	EPA 524.2
TTHM-00-C	TOTAL TRIHALOMETHANES	0.0170	0.0005	mg/L	EPA 524.2

Laboratory Comments:

Quality control results for dalapon and trichloroacetic acid were outside allowed limits due to matrix interferences.

By authority of PA 368 of 1978 as amended.

Print Date: Thu Feb 13 13:23:23 EST
2014

RM



**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
LF02287

Official Laboratory Report

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

System Name/Owner: NORTH FLINT AUTO
Collection Address: 6204 N SAGINAW ST, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP3
Collector: Public Water Supply Operator
Date Collected: 11/20/2013 13:05
Date Received: 11/21/2013 12:21
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Dalapon and Haloacetic

Bromoacetic acid	Not Detected	11/27/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.004	11/27/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	11/27/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	11/27/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.001	11/27/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	11/27/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.015	11/27/2013	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.008	11/27/2013	0.001		EPA 552.1/552.2	76-03-9

Quality control results for dalapon and trichloroacetic acid were outside allowed limits due to matrix interferences.

Total Trihalomethanes

Bromodichloromethane	0.0059	11/25/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	11/25/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0027	11/25/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0084	11/25/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0170	11/25/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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
LF02287

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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
LF02286

Official Laboratory Report

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

System Name/Owner: UNIVERSITY MARKET
Collection Address: 2501 FLUSHING RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP4
Collector: Public Water Supply Operator
Date Collected: 11/20/2013 12:19
Date Received: 11/21/2013 12:21
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	11/27/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	11/27/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	11/27/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	11/27/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	11/27/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	11/27/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.012	11/27/2013	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.008	11/27/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0064	11/25/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	11/25/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0027	11/25/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.010	11/25/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0191	11/25/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LF02285

Official Laboratory Report

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

System Name/Owner: LIQUOR PALACE
Collection Address: 3302 S DORT HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP2
Collector: Public Water Supply Operator
Date Collected: 11/20/2013 11:25
Date Received: 11/21/2013 12:21
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	11/27/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	11/27/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	11/27/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	11/27/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	11/27/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	11/27/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.014	11/27/2013	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.008	11/27/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0060	11/25/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	11/25/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0025	11/25/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0087	11/25/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0172	11/25/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

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



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

USEPA Region V Drinking Water Cert. No. MI00003

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

Sample Number
LF02284

Official Laboratory Report

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

System Name/Owner: MCDONALDS
Collection Address: 3719 DAVISON RD, FLINT
Collected By: MICHAEL GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP1
Collector: Public Water Supply Operator
Date Collected: 11/20/2013 09:12
Date Received: 11/21/2013 12:21
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	11/27/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.004	11/27/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	11/27/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	11/27/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.001	11/27/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.010	11/27/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.019	11/27/2013	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.008	11/27/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0075	11/25/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	11/25/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0030	11/25/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.017	11/25/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0275	11/25/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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

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

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

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

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

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LE89774**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: MCDONALDS
Collection Address: 3719 DAVISON RD, FLINT
Collected By: MICHAEL GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP1
Collector: Public Water Supply Operator
Date Collected: 08/21/2013 12:40
Date Received: 08/22/2013 12:32
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/27/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	08/27/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/27/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/27/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	08/27/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.010	08/27/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.017	08/27/2013	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	08/27/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.010	08/30/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	08/30/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0035	08/30/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.035	08/30/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0485	08/30/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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
LE89774**



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LE89772

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: NORTH FLINT AUTO
Collection Address: 6204 N SAGINAW ST, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP3
Collector: Public Water Supply Operator
Date Collected: 08/21/2013 12:00
Date Received: 08/22/2013 12:32
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/30/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	08/30/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/30/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/30/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.001	08/30/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.009	08/30/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.015	08/30/2013	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	08/30/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0088	08/30/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	08/30/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0040	08/30/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.016	08/30/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0288	08/30/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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

LE89772



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LE89771**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: 2501 FLUSHING RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP4
Collector: Public Water Supply Operator
Date Collected: 08/21/2013 11:17
Date Received: 08/22/2013 12:32
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/27/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	Not Detected	08/27/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/27/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/27/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.001	08/27/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	08/27/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.013	08/27/2013	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.007	08/27/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0088	08/30/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	08/30/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0039	08/30/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.017	08/30/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0297	08/30/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LE89773**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: 3302 S DORT HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP2
Collector: Public Water Supply Operator
Date Collected: 08/21/2013 10:37
Date Received: 08/22/2013 12:32
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/27/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	Not Detected	08/27/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/27/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/27/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	08/27/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	08/27/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.014	08/27/2013	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.006	08/27/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0089	08/30/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	08/30/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0039	08/30/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.018	08/30/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0308	08/30/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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
LE89773**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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)
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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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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
LE74994**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: MCDONALDS
Collection Address: 3719 DAVISON RD, FLINT
Collected By: MICHAEL GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP1
Collector: Public Water Supply Operator
Date Collected: 05/22/2013 11:10
Date Received: 05/23/2013 11:10
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/30/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.004	05/30/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/30/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/30/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.001	05/30/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.010	05/30/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.018	05/30/2013	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.007	05/30/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0082	06/04/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	TRACE	06/04/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0030	06/04/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.020	06/04/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0312	06/04/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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
LE74994

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts:
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



**Sample Number
LE74995**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: 3302 S DORT HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP2
Collector: Public Water Supply Operator
Date Collected: 05/22/2013 10:12
Date Received: 05/23/2013 11:10
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/30/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	05/30/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/30/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/30/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.001	05/30/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	05/30/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.011	05/30/2013	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	05/30/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0056	06/04/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	TRACE	06/04/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0023	06/04/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0076	06/04/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0155	06/04/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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

LE74995

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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AL : Action Level
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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 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
LE74997

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: 2501 FLUSHING RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP4
Collector: Public Water Supply Operator
Date Collected: 05/22/2013 10:40
Date Received: 05/23/2013 11:10
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/31/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	05/31/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/31/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/31/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	05/31/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	05/31/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.011	05/31/2013	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	05/31/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0060	06/04/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	TRACE	06/04/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0024	06/04/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0091	06/04/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0175	06/04/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LE74996

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: NORTH FLINT AUTO
Collection Address: 6204 N SAGINAW ST, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP3
Collector: Public Water Supply Operator
Date Collected: 05/22/2013 11:19
Date Received: 05/23/2013 11:10
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	06/04/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	06/04/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	06/04/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	06/04/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	06/04/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	06/04/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.008	06/04/2013	NA	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.004	06/04/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0057	06/04/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	TRACE	06/04/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0024	06/04/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0076	06/04/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0157	06/04/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS#: Chemical Abstract Service Registry Number
MCL: Maximum Contaminant Level
AL: Action Level
RL: Reporting Limit

mg/L: milligrams / Liter (ppm)
ppm: parts per million
MPN: Most Probable Number
CFU: Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number
LE70723



Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MICHAEL GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: FILTER EFFLUENT/POST OZONE
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Surface Water
Site Code:
Collector: Public Water Supply Operator
Date Collected: 04/18/2013 14:00
Date Received: 04/19/2013 13:05
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
^^^ NOT TESTED^^^	Not Tested	04/30/2013				NOTST-00-C
Carbamate (CXLP) analysis was not completed. Sample was lost in laboratory accident.						
Antimony	Not detected	04/26/2013	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	04/26/2013	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.03	04/26/2013	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	04/26/2013	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	04/26/2013	0.0003	0.005	EPA 200.8	7440-43-9
Chloride	74	04/19/2013	4		SM 4500-Cl E	7647-14-5
Chromium	Not detected	04/26/2013	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	04/24/2013	0.02	0.2	OIA-1677	57-12-5
Fluoride	0.13	04/19/2013	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	175	04/19/2013	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	04/19/2013	0.1		SM 3500 FeB	7439-89-6
Lead	0.002	04/26/2013	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	04/26/2013	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	04/26/2013	0.01	0.1	EPA 200.8	7440-02-0
Nitrate as N	1.6	04/19/2013	0.4	10	10-107-04-2-B	14797-55-8
Nitrite as N	Not detected	04/19/2013	0.05	1	10-107-04-2-B	14797-65-0
Selenium	Not detected	04/26/2013	0.001	0.05	EPA 200.8	7782-49-2
Sodium (automated)	11	04/19/2013	5		SM 3500 NaB	7440-23-5
Sulfate	20	04/19/2013	10		SM 4500 SO4E	14808-79-8
Thallium	Not detected	04/26/2013	0.0002	0.002	EPA 200.8	7440-28-0

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TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Chlorinated Acid Herbicides						
2,4,5-T	Not Detected	04/22/2013	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	04/22/2013	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	04/22/2013	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	04/22/2013	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	04/22/2013	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	04/22/2013	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	04/22/2013	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	04/22/2013	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	04/22/2013	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	04/22/2013	0.001		EPA 515.4	1861-32-1
Pesticides Analysis by GC/MS						
4,4'-DDD	Not Detected	04/23/2013	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	04/23/2013	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	04/23/2013	0.0005		EPA 525.2	50-29-3
Acetochlor	Not Detected	04/23/2013	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	04/23/2013	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	04/23/2013	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	04/23/2013	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	Not Detected	04/23/2013	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	04/23/2013	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	04/23/2013	0.0001	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	04/23/2013	0.001		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	04/23/2013	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	04/23/2013	0.0002	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	04/23/2013	0.0001	0.0002	EPA 525.2	1024-57-3
Hexachlorobenzene	Not Detected	04/23/2013	0.0001	0.001	EPA 525.2	118-74-1
Hexachlorocyclohexane (alpha-BHC)	Not Detected	04/23/2013	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	04/23/2013	0.001		EPA 525.2	319-85-7
Hexachlorocyclohexane (delta-BHC)	Not Detected	04/23/2013	0.001		EPA 525.2	319-86-8
Hexachlorocyclopentadiene	Not Detected	04/23/2013	0.0005	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	04/23/2013	0.0001	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	04/23/2013	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	04/23/2013	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	04/23/2013	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	04/23/2013	0.0005		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	04/23/2013	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1221)	Not Detected	04/23/2013	0.0001	0.0005	EPA 525.2	11104-28-2

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Sample Number

LE70723



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Pesticides Analysis by GC/MS						
PCB (aroclor 1232)	Not Detected	04/23/2013	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	04/23/2013	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	04/23/2013	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	04/23/2013	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	04/23/2013	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	04/23/2013	0.0001		EPA 525.2	59536-65-1
Simazine	Not Detected	04/23/2013	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	04/23/2013	0.001	0.003	EPA 525.2	8001-35-2
Volatile Organic Compounds						
1,1 Dichloroethane	Not Detected	04/24/2013	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	04/24/2013	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	04/24/2013	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	04/24/2013	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	04/24/2013	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	04/24/2013	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	04/24/2013	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	04/24/2013	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	04/24/2013	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	04/24/2013	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	04/24/2013	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	04/24/2013	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	04/24/2013	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	04/24/2013	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	04/24/2013	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	04/24/2013	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	04/24/2013	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	04/24/2013	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichloropropane	Not Detected	04/24/2013	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	04/24/2013	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	04/24/2013	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	04/24/2013	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.0010	04/24/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	04/24/2013	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	04/24/2013	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	04/24/2013	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	04/24/2013	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.0007	04/24/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	04/24/2013	0.0005		EPA 524.2	75-00-3

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Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LE70723

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Chloroform	0.0007	04/24/2013	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	0.0009	04/24/2013	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	04/24/2013	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	04/24/2013	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	04/24/2013	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	04/24/2013	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	04/24/2013	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	04/24/2013	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	04/24/2013	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	04/24/2013	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	04/24/2013	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	04/24/2013	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	04/24/2013	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	04/24/2013	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	04/24/2013	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	04/24/2013	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	04/24/2013	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	04/24/2013	0.01		EPA 524.2	98-95-3
n-Propylbenzene	Not Detected	04/24/2013	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	04/24/2013	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	04/24/2013	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	04/24/2013	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	04/24/2013	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	04/24/2013	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	04/24/2013	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	04/24/2013	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	04/24/2013	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	04/24/2013	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	04/24/2013	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.0024	04/24/2013	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	04/24/2013	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	04/24/2013	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	04/24/2013	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	04/24/2013	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	04/24/2013	0.0004	0.002	EPA 524.2	75-01-4

A trip blank was not available for analysis with this sample. The QC results for chloromethane were high. Results presented are estimated. This sample contained acetone at a concentration of 40 ppb.

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**Sample Number
LE70723**



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

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**Sample Number
LE64754**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: NORTH FLINT AUTO
Collection Address: 6204 N SAGINAW ST, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP3
Collector: Public Water Supply Operator
Date Collected: 02/20/2013 11:45
Date Received: 02/21/2013 12:51
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/02/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	03/02/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/02/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/02/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	03/02/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.003	03/02/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.006	03/02/2013	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	03/02/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0046	02/27/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	02/27/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0022	02/27/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0047	02/27/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0115	02/27/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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Sample Number
LE64753

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: 2501 FLUSHING RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP4
Collector: Public Water Supply Operator
Date Collected: 02/20/2013 10:40
Date Received: 02/21/2013 12:51
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	02/28/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	Not Detected	02/28/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	02/28/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	02/28/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.001	02/28/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	02/28/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.010	02/28/2013	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	02/28/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0049	02/27/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	02/27/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0022	02/27/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0056	02/27/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0127	02/27/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

CAS# : Chemical Abstract Service Registry Number
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ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LE64753

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



Sample Number

LE64755

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: 3302 S DORT HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP2
Collector: Public Water Supply Operator
Date Collected: 02/20/2013 10:20
Date Received: 02/21/2013 12:51
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/02/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	03/02/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/02/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/02/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	03/02/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.003	03/02/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.007	03/02/2013	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.004	03/02/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0048	02/27/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	02/27/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0022	02/27/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0052	02/27/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0122	02/27/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

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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

LE64755



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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Genesee County Health Dept.

630 South Saginaw

Flint, MI 48502-1540

810 257-3603

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MPN : Most Probable Number
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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
LE64756**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: MCDONALDS
Collection Address: 3719 DAVISON RD, FLINT
Collected By: MICHAEL GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point:
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP1
Collector: Public Water Supply Operator
Date Collected: 02/20/2013 08:50
Date Received: 02/21/2013 12:51
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/02/2013	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.004	03/02/2013	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/02/2013	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/02/2013	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.001	03/02/2013	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.009	03/02/2013	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.014	03/02/2013	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.004	03/02/2013	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.011	02/27/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	02/27/2013	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0038	02/27/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.029	02/27/2013	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0438	02/27/2013	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

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mg/L : milligrams / Liter (ppm)
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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

**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
LE61821

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: FILTER EFFLUENT
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Other
Site Code:
Collector: Public Water Supply Operator
Date Collected: 01/18/2013 06:30
Date Received: 01/18/2013 10:43
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	01/24/2013	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	01/24/2013	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.03	01/24/2013	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	01/24/2013	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	01/24/2013	0.0003	0.005	EPA 200.8	7440-43-9
Chloride	78	01/18/2013	4		SM 4500-Cl E	7647-14-5
Chromium	Not detected	01/24/2013	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	01/18/2013	0.02	0.2	OIA-1677	57-12-5
Fluoride	0.25	01/18/2013	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO ₃	276	01/18/2013	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	01/18/2013	0.1		SM 3500 FeB	7439-89-6
Lead	Not detected	01/24/2013	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not Detected	01/24/2013	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	01/24/2013	0.01	0.1	EPA 200.8	7440-02-0
Nitrate as N	1.0	01/18/2013	0.4	10	10-107-04-2-B	14797-55-8
Nitrite as N	Not detected	01/18/2013	0.05	1	10-107-04-2-B	14797-65-0
Selenium	Not detected	01/24/2013	0.001	0.05	EPA 200.8	7782-49-2
Sodium (automated)	20	01/18/2013	5		SM 3500 NaB	7440-23-5
Sulfate	49	01/18/2013	10		SM 4500 SO ₄ E	14808-79-8
Thallium	Not detected	01/24/2013	0.0002	0.002	EPA 200.8	7440-28-0
Carbamates by HPLC						
3 Hydroxycarbofuran	Not Detected	01/31/2013	0.001		EPA 531.2	16655-82-6

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DRINKING WATER LABORATORY**



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Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LE61821

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Carbamates by HPLC						
Aldicarb	Not Detected	01/31/2013	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	01/31/2013	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	01/31/2013	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	01/31/2013	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	01/31/2013	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	01/31/2013	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	01/31/2013	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	01/31/2013	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	01/31/2013	0.001		EPA 531.2	114-26-1
Chlorinated Acid Herbicides						
2,4,5-T	Not Detected	01/24/2013	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	01/24/2013	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	01/24/2013	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	01/24/2013	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	01/24/2013	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	01/24/2013	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	01/24/2013	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	01/24/2013	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	01/24/2013	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	01/24/2013	0.001		EPA 515.4	1861-32-1
Pesticides Analysis by GC/MS						
4,4'-DDD	Not Detected	01/24/2013	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	01/24/2013	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	01/24/2013	0.0005		EPA 525.2	50-29-3
Acetochlor	Not Detected	01/24/2013	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	01/24/2013	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	01/24/2013	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	01/24/2013	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	Not Detected	01/24/2013	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	01/24/2013	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	01/24/2013	0.0001	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	01/24/2013	0.001		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	01/24/2013	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	01/24/2013	0.0002	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	01/24/2013	0.0001	0.0002	EPA 525.2	1024-57-3
Hexachlorobenzene	Not Detected	01/24/2013	0.0001	0.001	EPA 525.2	118-74-1

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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
LE61821

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Pesticides Analysis by GC/MS						
Hexachlorocyclohexane (alpha-BHC)	Not Detected	01/24/2013	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	01/24/2013	0.001		EPA 525.2	319-85-7
Hexachlorocyclohexane (delta-BHC)	Not Detected	01/24/2013	0.001		EPA 525.2	319-86-8
Hexachlorocyclopentadiene	Not Detected	01/24/2013	0.0005	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	01/24/2013	0.0001	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	01/24/2013	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	01/24/2013	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	01/24/2013	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	01/24/2013	0.0005		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1221)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	11104-28-2
PCB (aroclor 1232)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	01/24/2013	0.0001		EPA 525.2	59536-65-1
Simazine	Not Detected	01/24/2013	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	01/24/2013	0.001	0.003	EPA 525.2	8001-35-2
Volatile Organic Compounds						
1,1 Dichloroethane	Not Detected	01/23/2013	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	01/23/2013	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	01/23/2013	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	01/23/2013	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	01/23/2013	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	01/23/2013	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	01/23/2013	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	01/23/2013	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	01/23/2013	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	01/23/2013	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	01/23/2013	0.0005	0.075	EPA 524.2	106-46-7

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Laboratory Contacts
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Systems Mgmt. Unit Mgr: George Krisztian

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Lansing, MI 48909
TEL: (517) 335-8184
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Sample Number
LE61821

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
2,2 Dichloropropane	Not Detected	01/23/2013	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	01/23/2013	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.0005	01/23/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	01/23/2013	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	01/23/2013	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	01/23/2013	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.0006	01/23/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	01/23/2013	0.0005		EPA 524.2	75-00-3
Chloroform	Not Detected	01/23/2013	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	01/23/2013	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	01/23/2013	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	01/23/2013	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	01/23/2013	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	01/23/2013	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	01/23/2013	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	01/23/2013	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	01/23/2013	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	01/23/2013	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	01/23/2013	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	01/23/2013	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	01/23/2013	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	01/23/2013	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	01/23/2013	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	01/23/2013	0.01		EPA 524.2	98-95-3
n-Propylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	01/23/2013	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	01/23/2013	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	01/23/2013	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	01/23/2013	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	01/23/2013	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	01/23/2013	0.005		EPA 524.2	109-99-9

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Laboratory Contacts
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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
LE61821**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Toluene	Not Detected	01/23/2013	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.0011	01/23/2013	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	01/23/2013	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	01/23/2013	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	01/23/2013	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	01/23/2013	0.0004	0.002	EPA 524.2	75-01-4

A trip blank was not available for analysis with this sample. This sample contained acetone at an approximate concentration of 20 ppb.

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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Sample Number

LE61821

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: FILTER EFFLUENT
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: Other
Site Code:
Collector: Public Water Supply Operator
Date Collected: 01/18/2013 06:30
Date Received: 01/18/2013 10:43
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	01/24/2013	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	01/24/2013	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.03	01/24/2013	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	01/24/2013	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	01/24/2013	0.0003	0.005	EPA 200.8	7440-43-9
Chloride	78	01/18/2013	4		SM 4500-Cl E	7647-14-5
Chromium	Not detected	01/24/2013	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	01/18/2013	0.02	0.2	OIA-1677	57-12-5
Fluoride	0.25	01/18/2013	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO ₃	276	01/18/2013	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	01/18/2013	0.1		SM 3500 FeB	7439-89-6
Lead	Not detected	01/24/2013	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not Detected	01/24/2013	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	01/24/2013	0.01	0.1	EPA 200.8	7440-02-0
Nitrate as N	1.0	01/18/2013	0.4	10	10-107-04-2-B	14797-55-8
Nitrite as N	Not detected	01/18/2013	0.05	1	10-107-04-2-B	14797-65-0
Selenium	Not detected	01/24/2013	0.001	0.05	EPA 200.8	7782-49-2
Sodium (automated)	20	01/18/2013	5		SM 3500 NaB	7440-23-5
Sulfate	49	01/18/2013	10		SM 4500 SO4E	14808-79-8
Thallium	Not detected	01/24/2013	0.0002	0.002	EPA 200.8	7440-28-0
Carbamates by HPLC						
3 Hydroxycarbofuran	Not Detected	01/31/2013	0.001		EPA 531.2	16655-82-6

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Sample Number**LE61821**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Carbamates by HPLC						
Aldicarb	Not Detected	01/31/2013	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	01/31/2013	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	01/31/2013	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	01/31/2013	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	01/31/2013	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	01/31/2013	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	01/31/2013	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	01/31/2013	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	01/31/2013	0.001		EPA 531.2	114-26-1
Chlorinated Acid Herbicides						
2,4,5-T	Not Detected	01/24/2013	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	01/24/2013	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	01/24/2013	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	01/24/2013	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	01/24/2013	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	01/24/2013	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	01/24/2013	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	01/24/2013	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	01/24/2013	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	01/24/2013	0.001		EPA 515.4	1861-32-1
Pesticides Analysis by GC/MS						
4,4'-DDD	Not Detected	01/24/2013	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	01/24/2013	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	01/24/2013	0.0005		EPA 525.2	50-29-3
Acetochlor	Not Detected	01/24/2013	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	01/24/2013	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	01/24/2013	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	01/24/2013	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	Not Detected	01/24/2013	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	01/24/2013	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	01/24/2013	0.0001	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	01/24/2013	0.001		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	01/24/2013	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	01/24/2013	0.0002	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	01/24/2013	0.0001	0.0002	EPA 525.2	1024-57-3
Hexachlorobenzene	Not Detected	01/24/2013	0.0001	0.001	EPA 525.2	118-74-1

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Lansing, MI 48909

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FAX: (517) 335-8562

Sample Number**LE61821**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Pesticides Analysis by GC/MS						
Hexachlorocyclohexane (alpha-BHC)	Not Detected	01/24/2013	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	01/24/2013	0.001		EPA 525.2	319-85-7
Hexachlorocyclohexane (delta-BHC)	Not Detected	01/24/2013	0.001		EPA 525.2	319-86-8
Hexachlorocyclopentadiene	Not Detected	01/24/2013	0.0005	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	01/24/2013	0.0001	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	01/24/2013	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	01/24/2013	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	01/24/2013	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	01/24/2013	0.0005		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1221)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	11104-28-2
PCB (aroclor 1232)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	01/24/2013	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	01/24/2013	0.0001		EPA 525.2	59536-65-1
Simazine	Not Detected	01/24/2013	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	01/24/2013	0.001	0.003	EPA 525.2	8001-35-2
Volatile Organic Compounds						
1,1 Dichloroethane	Not Detected	01/23/2013	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	01/23/2013	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	01/23/2013	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	01/23/2013	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	01/23/2013	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	01/23/2013	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	01/23/2013	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	01/23/2013	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	01/23/2013	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	01/23/2013	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	01/23/2013	0.0005	0.075	EPA 524.2	106-46-7

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Sample Number

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TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
2,2 Dichloropropane	Not Detected	01/23/2013	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	01/23/2013	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.0005	01/23/2013	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	01/23/2013	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	01/23/2013	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	01/23/2013	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.0006	01/23/2013	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	01/23/2013	0.0005		EPA 524.2	75-00-3
Chloroform	Not Detected	01/23/2013	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	01/23/2013	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	01/23/2013	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	01/23/2013	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	01/23/2013	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	01/23/2013	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	01/23/2013	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	01/23/2013	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	01/23/2013	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	01/23/2013	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	01/23/2013	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	01/23/2013	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	01/23/2013	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	01/23/2013	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	01/23/2013	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	01/23/2013	0.01		EPA 524.2	98-95-3
n-Propylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	01/23/2013	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	01/23/2013	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	01/23/2013	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	01/23/2013	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	01/23/2013	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	01/23/2013	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	01/23/2013	0.005		EPA 524.2	109-99-9

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Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Toluene	Not Detected	01/23/2013	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.0011	01/23/2013	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	01/23/2013	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	01/23/2013	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	01/23/2013	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	01/23/2013	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	01/23/2013	0.0004	0.002	EPA 524.2	75-01-4

A trip blank was not available for analysis with this sample. This sample contained acetone at an approximate concentration of 20 ppb.

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
LE56067

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: NORTH FLINT AUTO
Collection Address: 6204 N SAGINAW ST, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP3
Collector: Public Water Supply Operator
Date Collected: 11/20/2012 11:19
Date Received: 11/21/2012 11:19
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	11/27/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	11/27/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	11/27/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	11/27/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.001	11/27/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	11/27/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.011	11/27/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	11/27/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0057	11/30/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	11/30/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0026	11/30/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0073	11/30/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0156	11/30/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

Additional volatile organic compound(s) were detected. For quantitation and confirmation request analysis for CXVO.

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
LE56067

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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
LE56068

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: 2501 FLUSHING RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP4
Collector: Public Water Supply Operator
Date Collected: 11/20/2012 10:35
Date Received: 11/21/2012 11:19
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	11/27/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	11/27/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	11/27/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	11/27/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	11/27/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.003	11/27/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.008	11/27/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	11/27/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0066	11/27/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	11/27/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0029	11/27/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.010	11/27/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0195	11/27/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

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

LE56068



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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
LE56066

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: 3302 S DORT HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP2
Collector: Public Water Supply Operator
Date Collected: 11/20/2012 09:55
Date Received: 11/21/2012 11:19
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	11/27/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	11/27/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	11/27/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	11/27/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.001	11/27/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	11/27/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.011	11/27/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	11/27/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0052	11/27/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	11/27/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0023	11/27/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0077	11/27/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0152	11/27/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LE56065**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: MCDONALDS
Collection Address: 3719 DAVISON RD, FLINT
Collected By: MICHAEL GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP1
Collector: Public Water Supply Operator
Date Collected: 11/20/2012 09:00
Date Received: 11/21/2012 11:19
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	11/27/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.004	11/27/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	11/27/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	11/27/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.002	11/27/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.010	11/27/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.018	11/27/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.006	11/27/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.011	11/27/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	11/27/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0041	11/27/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.027	11/27/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0421	11/27/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

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

LE56065



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LE44312**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MICHAEL GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: LAB TAP
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE III
Site Code:
Collector: Public Water Supply Operator
Date Collected: 08/23/2012 07:30
Date Received: 08/23/2012 11:48
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Chloride	10	08/23/2012	4		SM 4500-Cl E	7647-14-5
Fluoride	0.64	08/23/2012	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO ₃	102	08/23/2012	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	08/23/2012	0.1		SM 3500 FeB	7439-89-6
Nitrate as N	Not Detected	08/23/2012	0.4	10	SM 4500 NO ₃ H	14797-55-8
Nitrite as N	Not detected	08/23/2012	0.05	1	SM 4500 NO ₃ H	14797-65-0
Sodium (automated)	Not detected	08/23/2012	5		SM 3500 NaB	7440-23-5
Sulfate	13	08/23/2012	10		SM 4500 SO ₄ E	14808-79-8

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**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LE44308**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: MCDONALDS
Collection Address: 3719 DAVISON RD, FLINT
Collected By: MICHAEL GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP1
Collector: Public Water Supply Operator
Date Collected: 08/22/2012 13:50
Date Received: 08/23/2012 11:48
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/28/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	08/28/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/28/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/28/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	08/28/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.011	08/28/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.016	08/28/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	08/28/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.013	09/01/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	09/01/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0048	09/01/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.040	09/01/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0578	09/01/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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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 Kristzian

**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

LE44311



Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: NORTH FLINT AUTO
Collection Address: 6204 N SAGINAW ST, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP3
Collector: Public Water Supply Operator
Date Collected: 08/22/2012 12:18
Date Received: 08/23/2012 11:48
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/29/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.004	08/29/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/29/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/29/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	08/29/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.012	08/29/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.019	08/29/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.007	08/29/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.010	09/01/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	TRACE	09/01/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0045	09/01/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.022	09/01/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0365	09/01/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LE44310**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: 2501 FLUSHING RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP4
Collector: Public Water Supply Operator
Date Collected: 08/22/2012 11:34
Date Received: 08/23/2012 11:48
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/28/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	Not Detected	08/28/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/28/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/28/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	08/28/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	08/28/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.013	08/28/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.008	08/28/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.011	09/01/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	TRACE	09/01/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0049	09/01/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.026	09/01/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0419	09/01/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

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**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LE44309**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: 3302 S DORT HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP2
Collector: Public Water Supply Operator
Date Collected: 08/22/2012 10:57
Date Received: 08/23/2012 11:48
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	08/28/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	Not Detected	08/28/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	08/28/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	08/28/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	08/28/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	08/28/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.013	08/28/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.008	08/28/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0086	09/01/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	09/01/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0038	09/01/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.020	09/01/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0324	09/01/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

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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



**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

LE29101

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: NORTH FLINT AUTOMOTIVE
Collection Address: 6204 N SAGINAW ST, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP3
Collector: Public Water Supply Operator
Date Collected: 05/23/2012 11:59
Date Received: 05/24/2012 14:39
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/24/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	05/24/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/24/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/24/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	05/24/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.007	05/24/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.013	05/24/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.006	05/24/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0058	06/01/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	06/01/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0023	06/01/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0089	06/01/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0170	06/01/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

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

LE29101



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**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

LE29102



Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: 2501 FLUSHING RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP4
Collector: Public Water Supply Operator
Date Collected: 05/23/2012 11:08
Date Received: 05/24/2012 14:39
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/24/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	05/24/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/24/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/24/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	05/24/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.008	05/24/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.015	05/24/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.007	05/24/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0066	06/01/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	06/01/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0024	06/01/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.011	06/01/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0200	06/01/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

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**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LE29103



Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: 3302 S DORT HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP2
Collector: Public Water Supply Operator
Date Collected: 05/23/2012 10:33
Date Received: 05/24/2012 14:39
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/24/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	05/24/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/24/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/24/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	05/24/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.008	05/24/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.015	05/24/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.007	05/24/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0062	06/01/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	06/01/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0024	06/01/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.010	06/01/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0190	06/01/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

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MCL : Maximum Contaminant Level

AL : Action Level

RL : Reporting Limit

mg/L : milligrams / Liter (ppm)

ppm : parts per million

MPN : Most Probable Number

CFU : Colony Forming Unit

Laboratory Contacts

Drinking Water Unit Mgr: Julia Pieper

Systems Mgmt. Unit Mgr: George Krisztian

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LE29103



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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AL : Action Level
RL : Reporting Limit

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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

LE29100



Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: MCDONALDS
Collection Address: 3719 DAVISON RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DBP1
Collector: Public Water Supply Operator
Date Collected: 05/23/2012 09:15
Date Received: 05/24/2012 14:39
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	05/24/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	05/24/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	05/24/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	05/24/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	05/24/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.011	05/24/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.017	05/24/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.006	05/24/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0083	06/01/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	06/01/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0029	06/01/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.021	06/01/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0320	06/01/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

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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



2012 1st Quarter Water Quality Monitoring Results						
SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	McDonalds Davison Rd.	2/28/2012	11.3	7.41	78	1.13
#2	BP Gas Station Dort Hwy	2/28/2012	7.7	7.43	75	1.22
#3	7-11 S. Dort Hwy	2/28/2012	9.7	7.37	77	1.18
#4	Taco Bell Ballenger Rd.	2/28/2012	6.9	7.38	77	1.31
#5	7-11 Flushing Rd.	3/1/2012	8.5	7.35	77	1.13
#6	Salem Housing MLK Blvd.	3/1/2012	10.6	7.39	75	1.16
#7	Rite-Aid Clio Rd.	3/1/2012	9.3	7.47	76	1.19
#8	N. Flint Automotive N. Saginaw St.	3/1/2012	12.2	7.36	76	1.20
CS	Cedar Street Reservoir & Pump Station	3/1/2012	9.1	7.38	77	1.23
WS	West Side Reservoir & Pump Station	3/1/2012	6.4	7.33	78	1.20



**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
LE35013

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:	4500 N DORT HWY, FLINT	Source:	Other
Collected By:	M GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	06/29/2012 11:45
Sample Point:	COMBINED FILTER EFFLUENT - POST O3	Date Received:	07/03/2012 11:37
Water System:	Other	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
^^^ NOT TESTED^^^	Not Tested	07/17/2012				NOTST-00-C
Analysis for volatile organic compounds was not completed within EPA holding time due to a clerical error. Please resample for test code CXVO.						
Antimony	Not detected	07/12/2012	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	07/12/2012	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.05	07/12/2012	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	07/12/2012	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	07/12/2012	0.0003	0.005	EPA 200.8	7440-43-9
Chromium	Not detected	07/12/2012	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	07/09/2012	0.02	0.2	OIA-1677	57-12-5
Sample collection date was not given or incorrect date given. Results will be evaluated by regulating agency.						
Lead	Not detected	07/12/2012	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	07/12/2012	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	07/12/2012	0.01	0.1	EPA 200.8	7440-02-0
Selenium	Not detected	07/12/2012	0.001	0.05	EPA 200.8	7782-49-2
Thallium	Not detected	07/12/2012	0.0002	0.002	EPA 200.8	7440-28-0
Carbamates by HPLC						
3 Hydroxycarbofuran	Not Detected	07/13/2012	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	07/13/2012	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	07/13/2012	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	07/13/2012	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	07/13/2012	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	07/13/2012	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	07/13/2012	0.001		EPA 531.2	2032-65-7

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

LE35013

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Carbamates by HPLC						
Methomyl	Not Detected	07/13/2012	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	07/13/2012	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	07/13/2012	0.001		EPA 531.2	114-26-1
Chlorinated Acid Herbicides						
2,4,5-T	Not Detected	07/11/2012	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	07/11/2012	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	07/11/2012	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	07/11/2012	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	07/11/2012	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	07/11/2012	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	07/11/2012	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	07/11/2012	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	07/11/2012	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	07/11/2012	0.001		EPA 515.4	1861-32-1

Sample collection date was not given or incorrect date given. Results will be evaluated by regulating agency.

Quality control results for pentachlorophenol were outside allowed limits due to matrix interferences.

Pesticides Analysis by GC/MS

4,4'-DDD	Not Detected	07/09/2012	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	07/09/2012	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	07/09/2012	0.0005		EPA 525.2	50-29-3
Acetochlor	Not Detected	07/09/2012	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	07/09/2012	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	07/09/2012	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	07/09/2012	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	Not Detected	07/09/2012	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	07/09/2012	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	07/09/2012	0.0001	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	07/09/2012	0.001		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	07/09/2012	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	07/09/2012	0.0002	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	07/09/2012	0.0001	0.0002	EPA 525.2	1024-57-3
Hexachlorobenzene	Not Detected	07/09/2012	0.0001	0.001	EPA 525.2	118-74-1
Hexachlorocyclohexane (alpha-BHC)	Not Detected	07/09/2012	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	07/09/2012	0.001		EPA 525.2	319-85-7
Hexachlorocyclohexane (delta-BHC)	Not Detected	07/09/2012	0.001		EPA 525.2	319-86-8

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ppm : parts per million

MPN : Most Probable Number

CFU : Colony Forming Unit

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FAX: (517) 335-8562

Sample Number

LE35013

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Pesticides Analysis by GC/MS						
Hexachlorocyclopentadiene	Not Detected	07/09/2012	0.0005	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	07/09/2012	0.0001	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	07/09/2012	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	07/09/2012	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	07/09/2012	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	07/09/2012	0.0005		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1221)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	11104-28-2
PCB (aroclor 1232)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	07/09/2012	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	07/09/2012	0.0001		EPA 525.2	59536-65-1
Simazine	Not Detected	07/09/2012	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	07/09/2012	0.001	0.003	EPA 525.2	8001-35-2

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
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**Sample Number
LE26411**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:	2310
Collection Address:	4500 N DORT HWY, FLINT	Source:	Other
Collected By:	M GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Other
County:	Genesee	Date Collected:	05/03/2012 13:00
Sample Point:	COMBINED FILTER EFFLUENT/POST OZON	Date Received:	05/07/2012 12:35
Water System:	Other	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
^^^ NOT TESTED^^^	Not Tested	05/11/2012				NOTST-00-C
CXPT sample was lost in laboratory accident.						
Antimony	Not detected	05/11/2012	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	05/11/2012	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.04	05/11/2012	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	05/11/2012	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	05/11/2012	0.0003	0.005	EPA 200.8	7440-43-9
Chromium	Not detected	05/11/2012	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	05/07/2012	0.02	0.2	OIA-1677	57-12-5
Lead	Not detected	05/11/2012	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	05/11/2012	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	05/11/2012	0.01	0.1	EPA 200.8	7440-02-0
Selenium	Not detected	05/11/2012	0.001	0.05	EPA 200.8	7782-49-2
Thallium	Not detected	05/11/2012	0.0002	0.002	EPA 200.8	7440-28-0
Carbamates by HPLC						
3 Hydroxycarbofuran	Not Detected	05/17/2012	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	05/17/2012	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	05/17/2012	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	05/17/2012	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	05/17/2012	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	05/17/2012	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	05/17/2012	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	05/17/2012	0.001		EPA 531.2	16752-77-5

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Sample Number
LE26411

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Carbamates by HPLC						
Oxamyl	Not Detected	05/17/2012	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	05/17/2012	0.001		EPA 531.2	114-26-1
Chlorinated Acid Herbicides						
2,4,5-T	Not Detected	05/15/2012	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	05/15/2012	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	05/15/2012	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	05/15/2012	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	05/15/2012	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	05/15/2012	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	05/15/2012	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	05/15/2012	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	05/15/2012	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	05/15/2012	0.001		EPA 515.4	1861-32-1

Quality control results for bentazon and acifluorfen were outside allowed limits due to matrix interferences.

Volatile Organic Compounds

1,1 Dichloroethane	Not Detected	05/17/2012	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	05/17/2012	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	05/17/2012	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	05/17/2012	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	05/17/2012	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	05/17/2012	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	05/17/2012	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	05/17/2012	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	05/17/2012	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	05/17/2012	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	05/17/2012	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichloropropane	Not Detected	05/17/2012	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	71-43-2

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Sample Number
LE26411

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Bromobenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	05/17/2012	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.0065	05/17/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0023	05/17/2012	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	05/17/2012	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	05/17/2012	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.0086	05/17/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	05/17/2012	0.0005		EPA 524.2	75-00-3
Chloroform	0.0023	05/17/2012	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	05/17/2012	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	05/17/2012	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	05/17/2012	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	05/17/2012	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	05/17/2012	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	05/17/2012	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	05/17/2012	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	05/17/2012	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	05/17/2012	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	05/17/2012	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	05/17/2012	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	05/17/2012	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	05/17/2012	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	05/17/2012	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	05/17/2012	0.01		EPA 524.2	98-95-3
n-Propylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	05/17/2012	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	05/17/2012	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	05/17/2012	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	05/17/2012	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	05/17/2012	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	05/17/2012	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	05/17/2012	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	05/17/2012	0.0005	1	EPA 524.2	108-88-3

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Sample Number
LE26411

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Total Trihalomethanes	0.020	05/17/2012	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	05/17/2012	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	05/17/2012	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	05/17/2012	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	05/17/2012	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	05/17/2012	0.0004	0.002	EPA 524.2	75-01-4

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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



Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650
 e-mail: bai-brighton@sbcglobal.net

2310
 FINISH ARSENIC
 200 QTR 2012
 (SENT WITH APRIL
 M02'S)

Sample Date: 4/12/2012
 Submit Date: 4/13/2012
 Report Date: 4/17/2012

To: City of Davison
 200 E. Flint St.
 Davison, MI 48423

BA Report Number: **19010**
 BA Sample ID: **BW07621**

Project Name: **Davison Water Treat. Plant/NPDES&Finish As**
 Project Number: **Permit #MI0057427**
 Sample ID: **Plant Finish**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
Total Metal Analysis						
Total Arsenic	1	ug/L	1	EPA 200.8 rev5.4	GW	4/16/2012
Metal Water Total (digest)	Digested			3015	LS	4/16/2012

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by:

Date:

W. J. P. D.
 4/20/12

**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
LE20190**



Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner:	SALEMS HOUSING	WSSN/Pool ID:	2310
Collection Address:	MARTIN LUTHER KING BLVD, FLINT	Source:	TYPE III
Collected By:	NICOLE ALEXANDER	Site Code:	DIST #6
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	03/13/2012 11:40
Sample Point:	SINK	Date Received:	03/15/2012 11:45
Water System:	Other	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/21/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	Not Detected	03/21/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/21/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/21/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	03/21/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	03/21/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.007	03/21/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	03/21/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0047	03/20/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	03/20/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0023	03/20/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0056	03/20/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0130	03/20/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LE20189



Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: FLUSHING RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST #5
Collector: Public Water Supply Operator
Date Collected: 03/13/2012 11:24
Date Received: 03/15/2012 11:45
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/21/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	03/21/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/21/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/21/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	03/21/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	03/21/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.010	03/21/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	03/21/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0051	03/20/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	03/20/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0024	03/20/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0072	03/20/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0150	03/20/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS#: Chemical Abstract Service Registry Number
MCL: Maximum Contaminant Level
AL: Action Level
RL: Reporting Limit

mg/L: milligrams / Liter (ppm)
ppm: parts per million
MPN: Most Probable Number
CFU: Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LE20188



Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: TACO BELL
Collection Address: BALLENGER RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DISTR #4
Collector: Public Water Supply Operator
Date Collected: 03/13/2012 11:13
Date Received: 03/15/2012 11:45
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/21/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	03/21/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/21/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/21/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	03/21/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	03/21/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.008	03/21/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.004	03/21/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0049	03/20/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	03/20/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0023	03/20/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0061	03/20/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0130	03/20/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LE20187**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: S DORT HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST #3
Collector: Public Water Supply Operator
Date Collected: 03/13/2012 10:47
Date Received: 03/15/2012 11:45
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/21/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	03/21/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/21/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/21/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	03/21/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	03/21/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.007	03/21/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	03/21/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0045	03/20/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	03/20/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0022	03/20/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0057	03/20/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0120	03/20/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

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**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LE20186



Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: MCDONALDS
Collection Address: DAVISON RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DISTR #1
Collector: Public Water Supply Operator
Date Collected: 03/13/2012 10:30
Date Received: 03/15/2012 11:45
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/20/2012	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	03/20/2012	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/20/2012	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/20/2012	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	03/20/2012	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	03/20/2012	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.008	03/20/2012	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.004	03/20/2012	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0045	03/20/2012	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	03/20/2012	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0023	03/20/2012	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0055	03/20/2012	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0120	03/20/2012	0.0005	0.080	EPA 524.2	TTHM-00-C

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

LE20186



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number

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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
LE11083**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner:	SALEMS HOUSING	WSSN/Pool ID:	2310
Collection Address:	MARTIN LUTHER KING BLVD, FLINT	Source:	TYPE III
Collected By:	NICOLE ALEXANDER	Site Code:	DIST #11
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	12/06/2011 11:15
Sample Point:	SINK	Date Received:	12/07/2011 11:10
Water System:	Other	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	12/08/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	12/08/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	12/08/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.009	12/08/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	12/08/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0061	12/08/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	12/08/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0026	12/08/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0087	12/08/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0170	12/08/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

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AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LE11087



Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: FLUSHING RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST #2
Collector: Public Water Supply Operator
Date Collected: 12/06/2011 11:03
Date Received: 12/07/2011 11:10
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Dalapon and Haloacetic

Bromoacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	12/08/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	12/08/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.003	12/08/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.008	12/08/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	12/08/2011	0.001		EPA 552.1/552.2	76-03-9

Total Trihalomethanes

Bromodichloromethane	0.0067	12/08/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	12/08/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0028	12/08/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.010	12/08/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0200	12/08/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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

LE11087



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS#: Chemical Abstract Service Registry Number
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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
LE11086

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: TACO BELL
Collection Address: BALLENGER HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST #4
Collector: Public Water Supply Operator
Date Collected: 12/06/2011 10:48
Date Received: 12/07/2011 11:10
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	12/08/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	12/08/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	12/08/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	12/08/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.010	12/08/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.006	12/08/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0065	12/08/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	12/08/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0027	12/08/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0090	12/08/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0180	12/08/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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

LE11086



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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

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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
LE11085**

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: S DORT HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST #6
Collector: Public Water Supply Operator
Date Collected: 12/06/2011 10:25
Date Received: 12/07/2011 11:10
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	12/08/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	12/08/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	12/08/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	12/08/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.011	12/08/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.006	12/08/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0064	12/08/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	12/08/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0026	12/08/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0093	12/08/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0180	12/08/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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**Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603**

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number

LE11084

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: MCDONALDS
Collection Address: DAVISON RD, FLINT
Collected By: MICHAEL GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST #10
Collector: Public Water Supply Operator
Date Collected: 12/06/2011 09:53
Date Received: 12/07/2011 11:10
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	12/08/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	12/08/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	12/08/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.002	12/08/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.007	12/08/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	12/08/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0084	12/08/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	12/08/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0034	12/08/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.012	12/08/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0240	12/08/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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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

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

LE11084



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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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
LE11088

Official Laboratory Report

Report To: MICHAEL GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: MIKE GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: FILTER EFFLUENT
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code:
Collector: Public Water Supply Operator
Date Collected: 12/02/2011 08:00
Date Received: 12/07/2011 11:11
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	12/09/2011	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	12/09/2011	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.04	12/09/2011	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	12/09/2011	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	12/09/2011	0.0003	0.005	EPA 200.8	7440-43-9
Chromium	Not detected	12/09/2011	0.01	0.1	EPA 200.8	7440-47-3
Cyanide-Available	Not Detected	12/09/2011	0.02	0.2	OIA-1677	57-12-5
Lead	Not detected	12/09/2011	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	12/09/2011	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	12/09/2011	0.01	0.1	EPA 200.8	7440-02-0
Selenium	Not detected	12/09/2011	0.001	0.05	EPA 200.8	7782-49-2
Thallium	Not detected	12/09/2011	0.0002	0.002	EPA 200.8	7440-28-0
Carbamates by HPLC						
3 Hydroxycarbofuran	Not Detected	12/15/2011	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	12/15/2011	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	12/15/2011	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	12/15/2011	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	12/15/2011	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	12/15/2011	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	12/15/2011	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	12/15/2011	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	12/15/2011	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	12/15/2011	0.001		EPA 531.2	114-26-1

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DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

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Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number

LE11088

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Carbamates by HPLC

Chlorinated Acid Herbicides

2,4,5-T	Not Detected	12/07/2011	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	12/07/2011	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	12/07/2011	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	12/07/2011	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	12/07/2011	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	12/07/2011	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	12/07/2011	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	12/07/2011	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	12/07/2011	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	12/07/2011	0.001		EPA 515.4	1861-32-1

Pesticides Analysis by GC/MS

4,4'-DDD	Not Detected	12/13/2011	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	12/13/2011	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	12/13/2011	0.0005		EPA 525.2	50-29-3
Acetochlor	Not Detected	12/13/2011	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	12/13/2011	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	12/13/2011	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	12/13/2011	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	Not Detected	12/13/2011	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	12/13/2011	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	12/13/2011	0.0001	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	12/13/2011	0.001		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	12/13/2011	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	12/13/2011	0.0002	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	12/13/2011	0.0001	0.0002	EPA 525.2	1024-57-3
Hexachlorobenzene	Not Detected	12/13/2011	0.0001	0.001	EPA 525.2	118-74-1
Hexachlorocyclohexane (alpha-BHC)	Not Detected	12/13/2011	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	12/13/2011	0.001		EPA 525.2	319-85-7
Hexachlorocyclohexane (delta-BHC)	Not Detected	12/13/2011	0.001		EPA 525.2	319-86-8
Hexachlorocyclopentadiene	Not Detected	12/13/2011	0.0005	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	12/13/2011	0.0001	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	12/13/2011	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	12/13/2011	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	12/13/2011	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	12/13/2011	0.0005		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	12/13/2011	0.0001	0.0005	EPA 525.2	12674-11-2

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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
LE11088**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Pesticides Analysis by GC/MS						
PCB (aroclor 1221)	Not Detected	12/13/2011	0.0001	0.0005	EPA 525.2	11104-28-2
PCB (aroclor 1232)	Not Detected	12/13/2011	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	12/13/2011	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	12/13/2011	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	12/13/2011	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	12/13/2011	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	12/13/2011	0.0001		EPA 525.2	59536-65-1
Simazine	Not Detected	12/13/2011	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	12/13/2011	0.001	0.003	EPA 525.2	8001-35-2
Volatile Organic Compounds						
1,1 Dichloroethane	Not Detected	12/08/2011	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	12/08/2011	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	12/08/2011	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	12/08/2011	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	12/08/2011	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	12/08/2011	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	12/08/2011	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	12/08/2011	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	12/08/2011	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	12/08/2011	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	12/08/2011	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	12/08/2011	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	12/08/2011	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	12/08/2011	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	12/08/2011	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	12/08/2011	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	12/08/2011	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	12/08/2011	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichloropropane	Not Detected	12/08/2011	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	12/08/2011	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	12/08/2011	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	12/08/2011	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.012	12/08/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0007	12/08/2011	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	12/08/2011	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	12/08/2011	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	12/08/2011	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.0065	12/08/2011	0.0005	0.080	EPA 524.2	124-48-1

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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
LE11088

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Chloroethane	Not Detected	12/08/2011	0.0005		EPA 524.2	75-00-3
Chloroform	0.0079	12/08/2011	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	12/08/2011	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	12/08/2011	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	12/08/2011	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	12/08/2011	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	12/08/2011	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	12/08/2011	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	12/08/2011	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	12/08/2011	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	12/08/2011	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	12/08/2011	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	12/08/2011	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	12/08/2011	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	12/08/2011	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	12/08/2011	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	12/08/2011	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	12/08/2011	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	12/08/2011	0.01		EPA 524.2	98-95-3
n-Propylbenzene	Not Detected	12/08/2011	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	12/08/2011	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	12/08/2011	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	12/08/2011	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	12/08/2011	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	12/08/2011	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	12/08/2011	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	12/08/2011	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	12/08/2011	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	12/08/2011	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	12/08/2011	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.027	12/08/2011	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	12/08/2011	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	12/08/2011	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	12/08/2011	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	12/08/2011	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	Not Detected	12/08/2011	0.0004	0.002	EPA 524.2	75-01-4

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Laboratory Contacts

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Systems Mgmt. Unit Mgr: George Krisztfian

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Sample Number

LE11088



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.

630 South Saginaw

Flint, MI 48502-1540

810 257-3603

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Sample Number

LD59541

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: M GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: FILTER EFFLUENT
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 11/05/2010 10:00
Date Received: 11/10/2010 14:46
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	11/11/2010	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	11/11/2010	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.04	11/11/2010	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	11/11/2010	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	11/11/2010	0.0003	0.005	EPA 200.8	7440-43-9
Chromium	Not detected	11/11/2010	0.01	0.1	EPA 200.8	7440-47-3
Lead	Not detected	11/11/2010	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	11/11/2010	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	11/11/2010	0.01	0.1	EPA 200.8	7440-02-0
Selenium	0.003	11/11/2010	0.001	0.05	EPA 200.8	7782-49-2
Thallium	Not detected	11/11/2010	0.0002	0.002	EPA 200.8	7440-28-0
Carbamates by HPLC						
3 Hydroxycarbofuran	Not Detected	11/30/2010	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	11/30/2010	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	11/30/2010	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	11/30/2010	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	11/30/2010	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	11/30/2010	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	11/30/2010	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	11/30/2010	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	11/30/2010	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	11/30/2010	0.001		EPA 531.2	114-26-1

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TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Chlorinated Acid Herbicides						
2,4,5-T	Not Detected	11/17/2010	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	11/17/2010	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	11/17/2010	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	11/17/2010	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	11/17/2010	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	11/17/2010	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	11/17/2010	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	11/17/2010	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	11/17/2010	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	11/17/2010	0.001		EPA 515.4	1861-32-1
Pesticides Analysis by GC/MS						
4,4'-DDD	Not Detected	11/15/2010	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	11/15/2010	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	11/15/2010	0.001		EPA 525.2	50-29-3
Acetochlor	Not Detected	11/15/2010	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	11/15/2010	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	11/15/2010	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	11/15/2010	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	Not Detected	11/15/2010	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	11/15/2010	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	11/15/2010	0.00005	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	11/15/2010	0.002		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	11/15/2010	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	11/15/2010	0.00008	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	11/15/2010	0.00004	0.0002	EPA 525.2	1024-57-3
Hexachlorobenzene	Not Detected	11/15/2010	0.0001	0.001	EPA 525.2	118-74-1
Hexachlorocyclohexane (alpha-BHC)	Not Detected	11/15/2010	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	11/15/2010	0.001		EPA 525.2	319-85-7
Hexachlorocyclohexane (delta-BHC)	Not Detected	11/15/2010	0.001		EPA 525.2	319-86-8
Hexachlorocyclopentadiene	Not Detected	11/15/2010	0.0002	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	11/15/2010	0.00004	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	11/15/2010	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	11/15/2010	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	11/15/2010	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	11/15/2010	0.002		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1221)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	11104-28-2

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Laboratory Contacts

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Systems Mgmt. Unit Mgr: George Knsztian

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LD59541

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Pesticides Analysis by GC/MS

PCB (aroclor 1232)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	11/15/2010	0.001		EPA 525.2	59536-65-1
Simazine	Not Detected	11/15/2010	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	11/15/2010	0.001	0.003	EPA 525.2	8001-35-2

Recovery of simazine in the matrix spike was above the acceptable level due to matrix interference.

Volatile Organic Compounds

1,1 Dichloroethane	Not Detected	11/12/2010	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	11/12/2010	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	11/12/2010	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	11/12/2010	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	11/12/2010	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	11/12/2010	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	11/12/2010	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	11/12/2010	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	11/12/2010	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	11/12/2010	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	11/12/2010	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichloropropane	Not Detected	11/12/2010	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	11/12/2010	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.0028	11/12/2010	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0028	11/12/2010	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	11/12/2010	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	11/12/2010	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.0059	11/12/2010	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	11/12/2010	0.0005		EPA 524.2	75-00-3

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TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Chloroform	0.0010	11/12/2010	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	11/12/2010	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	11/12/2010	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	11/12/2010	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	11/12/2010	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	11/12/2010	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	11/12/2010	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	11/12/2010	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	11/12/2010	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	11/12/2010	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	11/12/2010	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	11/12/2010	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	11/12/2010	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	11/12/2010	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	11/12/2010	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	11/12/2010	0.01		EPA 524.2	98-95-3
n-Propylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	11/12/2010	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	11/12/2010	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	11/12/2010	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	11/12/2010	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	11/12/2010	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	11/12/2010	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	11/12/2010	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.013	11/12/2010	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	11/12/2010	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	11/12/2010	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	11/12/2010	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	0.0012	11/12/2010	0.0004	0.002	EPA 524.2	75-01-4

A trip blank was not available for analysis with this sample. This sample also contained Acetone at a concentration of 0.03mg/L. (30ppb).

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 NATURAL RESOURCES AND ENVIRONMENT

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

LD59541

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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
LD99861

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner:	SALEMS HOUSING	WSSN/Pool ID:	2310
Collection Address:	MARTIN LUTHER KING BLVD, FLINT	Source:	TYPE III
Collected By:	NICOLE ALEXANDER	Site Code:	DIST 11
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	09/08/2011 11:35
Sample Point:	SINK	Date Received:	09/12/2011 11:05
Water System:	Other	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	09/17/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	09/17/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	09/17/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	09/17/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	09/17/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	09/17/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.013	09/17/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.008	09/17/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0086	09/14/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	09/14/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0032	09/14/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.021	09/14/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0330	09/14/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LD99863

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: FLUSHING RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST 2
Collector: Public Water Supply Operator
Date Collected: 09/08/2011 11:19
Date Received: 09/12/2011 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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	09/17/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	09/17/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	09/17/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	09/17/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	09/17/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.007	09/17/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.014	09/17/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.007	09/17/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0086	09/15/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	09/15/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0031	09/15/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.022	09/15/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0340	09/15/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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

LD99863



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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
LD99860

Official Laboratory Report

Report To: MIKE GLASGOW
 4500 N DORT HWY
 FLINT MI 48505

System Name/Owner:	7-11	WSSN/Pool ID:	2310
Collection Address:	DORT HWY, FLINT	Source:	TYPE III
Collected By:	NICOLE ALEXANDER	Site Code:	DIST 6
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	09/08/2011 10:55
Sample Point:	SINK	Date Received:	09/12/2011 11:05
Water System:	Other	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Dalapon and Haloacetic

Bromoacetic acid	Not Detected	09/17/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	09/17/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	09/17/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	09/17/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	09/17/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	09/17/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.013	09/17/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.007	09/17/2011	0.001		EPA 552.1/552.2	76-03-9

Total Trihalomethanes

Bromodichloromethane	0.0085	09/14/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	09/14/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0032	09/14/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.020	09/14/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0320	09/14/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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
LD99860



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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
LD99862

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: MCDONALDS
Collection Address: DAVISON RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST 10
Collector: Public Water Supply Operator
Date Collected: 09/08/2011 10:32
Date Received: 09/12/2011 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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	09/17/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	Not Detected	09/17/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	09/17/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	09/17/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	09/17/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.004	09/17/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.011	09/17/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.007	09/17/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0085	09/15/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	09/15/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0031	09/15/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.024	09/15/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0360	09/15/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number

LD99859

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: CSII
Collector: Public Water Supply Operator
Date Collected: 09/08/2011 09:45
Date Received: 09/12/2011 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 #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	09/17/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	09/17/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	09/17/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	09/17/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	09/17/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.007	09/17/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.013	09/17/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.006	09/17/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0068	09/14/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	09/14/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0027	09/14/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.013	09/14/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0230	09/14/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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

LD99859



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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
LD84508**

Official Laboratory Report

Report To: **MIKE GLASGOW**
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: **CITY OF FLINT**
Collection Address: **4500 N DORT HWY, FLINT**
Collected By: **MIKE GLASGOW**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **FILTER EFFLUENT C F E**
Water System: **Other**

WSSN/Pool ID:
Source: **TYPE I**
Site Code:
Collector: **Public Water Supply Operator**
Date Collected: **06/10/2011 10:00**
Date Received: **06/13/2011 14:11**
Purpose: **Other**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	06/14/2011	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	06/14/2011	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.04	06/14/2011	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	06/14/2011	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	06/14/2011	0.0003	0.005	EPA 200.8	7440-43-9
Chromium	Not detected	06/14/2011	0.01	0.1	EPA 200.8	7440-47-3
Lead	Not detected	06/14/2011	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	06/14/2011	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	06/14/2011	0.01	0.1	EPA 200.8	7440-02-0
Selenium	0.002	06/14/2011	0.001	0.05	EPA 200.8	7782-49-2
Thallium	Not detected	06/14/2011	0.0002	0.002	EPA 200.8	7440-28-0
Chlorinated Acid (herbicides)						
2,4,5-T	Not Detected	06/15/2011	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	06/15/2011	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	06/15/2011	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	06/15/2011	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	06/15/2011	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	06/15/2011	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	06/15/2011	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	06/15/2011	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	06/15/2011	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradation, mono- and di-acid	Not Detected	06/15/2011	0.001		EPA 515.4	1861-32-1

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

LD84508

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	06/15/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.009	06/15/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	06/15/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	06/15/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	0.004	06/15/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.014	06/15/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.026	06/15/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.008	06/15/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.016	06/15/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0008	06/15/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0088	06/15/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.017	06/15/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0430	06/15/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS#: Chemical Abstract Service Registry Number

MCL: Maximum Contaminant Level

AL: Action Level

RL: Reporting Limit

mg/L: milligrams / Liter (ppm)

ppm: parts per million

MPN: Most Probable Number

CFU: Colony Forming Unit

Laboratory Contacts

Drinking Water Unit Mgr: Julia Pieper

Systems Mgmt. Unit Mgr: George Krisztian



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003
 P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-8184
 FAX: (517) 335-8562

Sample Number
LD84512

Official Laboratory Report

Report To: MIKE GLASGOW
 4500 N DORT
 FLINT MI 48505

System Name/Owner: DR BERNIE DENTAL
 Collection Address: BEECHER RD, FLINT
 Collected By: NICOLE ALEXANDER
 Township/Well#/Section: //
 County: Genesee
 Sample Point: SINK
 Water System: Other

WSSN/Pool ID: 2310
 Source: TYPE III
 Site Code: DIST #3
 Collector: Public Water Supply Operator
 Date Collected: 06/09/2011 11:00
 Date Received: 06/13/2011 14:15
 Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	06/15/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	06/15/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	06/15/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	06/15/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	06/15/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.005	06/15/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.010	06/15/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	06/15/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0046	06/15/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	06/15/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0019	06/15/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0065	06/15/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0130	06/15/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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Genesee County Health Dept.
 630 South Saginaw
 Flint, MI 48502-1540
 810 257-3603

CAS# : Chemical Abstract Service Registry Number
 MCL : Maximum Contaminant Level
 AL : Action Level
 RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
 ppm : parts per million
 MPN : Most Probable Number
 CFU : Colony Forming Unit

Laboratory Contacts
 Drinking Water Unit Mgr: Julia Pieper
 Systems Mgmt. Unit Mgr: George Krisztian



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-8184
 FAX: (517) 335-8562

Sample Number
LD84511

Official Laboratory Report

Report To: MIKE GLASGOW
 4500 N DORT
 FLINT MI 48505

System Name/Owner:	7-11	WSSN/Pool ID:	2310
Collection Address:	FLUSHING RD.FLINT	Source:	TYPE III
Collected By:	NICOLE ALEXANDER	Site Code:	DIST #2
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	06/09/2011 10:47
Sample Point:	SINK	Date Received:	06/13/2011 14:15
Water System:	Other	Purpose:	Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	06/15/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.002	06/15/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	06/15/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	06/15/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	06/15/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	06/15/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.011	06/15/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	06/15/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0047	06/15/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	06/15/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0019	06/15/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0077	06/15/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0140	06/15/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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Genesee County Health Dept.
 630 South Saginaw
 Flint, MI 48502-1540
 810 257-3603

CAS# : Chemical Abstract Service Registry Number
 MCL : Maximum Contaminant Level
 AL : Action Level
 RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
 ppm : parts per million
 MPN : Most Probable Number
 CFU : Colony Forming Unit

Laboratory Contacts
 Drinking Water Unit Mgr: Julia Pieper
 Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LD84514

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT
FLINT MI 48505

System Name/Owner: SALEM'S HOUSING
Collection Address: MARTIN LUTHER KING, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST #11
Collector: Public Water Supply Operator
Date Collected: 06/09/2011 10:30
Date Received: 06/13/2011 14:17
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	06/15/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	06/15/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	06/15/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	06/15/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	06/15/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	06/15/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.012	06/15/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.006	06/15/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0058	06/15/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	06/15/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0023	06/15/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0089	06/15/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0170	06/15/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS#: Chemical Abstract Service Registry Number
MCL: Maximum Contaminant Level
AL: Action Level
RL: Reporting Limit

mg/L: milligrams / Liter (ppm)
ppm: parts per million
MPN: Most Probable Number
CFU: Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LD84510

Official Laboratory Report

Report To: MIKE GLASGOW
4000 N DORT
FLINT MI 48505

System Name/Owner: RITE AID
Collection Address: CLIO RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well//Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST #1
Collector: Public Water Supply Operator
Date Collected: 06/09/2011 10:19
Date Received: 06/13/2011 14:15
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	06/15/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	06/15/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	06/15/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	06/15/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	06/15/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.007	06/15/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.012	06/15/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	06/15/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0057	06/15/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	06/15/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0021	06/15/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.010	06/15/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0180	06/15/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

**Sample Number
LD84513**

Official Laboratory Report

Report To: **MIKE GLASGOW**
4500 N DORT
FLINT MI 48505

System Name/Owner: **NORTH FLINT AUTO**
Collection Address: **SAGINAW ST, FLINT**
Collected By: **NICOLE ALEXANDER**
Township/Well#/Section: **//**
County: **Genesee**
Sample Point: **SINK**
Water System: **Other**

WSSN/Pool ID: **2310**
Source: **TYPE III**
Site Code: **DIST #9**
Collector: **Public Water Supply Operator**
Date Collected: **06/09/2011 10:06**
Date Received: **06/13/2011 14:15**
Purpose: **Routine Monitoring**

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	06/15/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.003	06/15/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	06/15/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	06/15/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	06/15/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.006	06/15/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.011	06/15/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.005	06/15/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0052	06/15/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	06/15/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0023	06/15/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0070	06/15/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0150	06/15/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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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 NATURAL RESOURCES ENVIRONMENT

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

LD71996

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: SALEMS HOUSING
Collection Address: MARTIN LUTHER KING, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST 11
Collector: Public Water Supply Operator
Date Collected: 03/03/2011 11:06
Date Received: 03/03/2011 13:53
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/03/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	03/03/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/03/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/03/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	03/03/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.003	03/03/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.006	03/03/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.003	03/03/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0040	03/08/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	03/08/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0020	03/08/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0047	03/08/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0110	03/08/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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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 NATURAL RESOURCES ENVIRONMENT
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
LD71992

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: FLUSHING RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST 2
Collector: Public Water Supply Operator
Date Collected: 03/03/2011 10:52
Date Received: 03/03/2011 13:53
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/03/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	03/03/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/03/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/03/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	03/03/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.003	03/03/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.007	03/03/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.004	03/03/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0041	03/08/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	03/08/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0020	03/08/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0052	03/08/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0110	03/08/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Genesee County Health Dept.
630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



MICHIGAN DEPARTMENT OF NATURAL RESOURCES ENVIRONMENT

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

LD71993

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: 7-11
Collection Address: DORT HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST 6
Collector: Public Water Supply Operator
Date Collected: 03/03/2011 10:22
Date Received: 03/03/2011 13:53
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/03/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	03/03/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/03/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/03/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	03/03/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.003	03/03/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.007	03/03/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.004	03/03/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0041	03/08/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	03/08/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0020	03/08/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0047	03/08/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0110	03/08/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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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 NATURAL RESOURCES AND ENVIRONMENT

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

LD71994

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: BP GAS
Collection Address: DORT HWY, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST 7
Collector: Public Water Supply Operator
Date Collected: 03/03/2011 10:10
Date Received: 03/03/2011 13:53
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/03/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	03/03/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/03/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/03/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	03/03/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.003	03/03/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.007	03/03/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.004	03/03/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0039	03/08/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	03/08/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0020	03/08/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0046	03/08/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0110	03/08/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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Flint, MI 48502-1540
810 257-3603

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RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
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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



MICHIGAN DEPARTMENT OF NATURAL RESOURCES ENVIRONMENT

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

LD71995

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: MCDONALDS
Collection Address: DAVISON RD, FLINT
Collected By: NICOLE ALEXANDER
Township/Well#/Section: //
County: Genesee
Sample Point: SINK
Water System: Other

WSSN/Pool ID: 2310
Source: TYPE III
Site Code: DIST 10
Collector: Public Water Supply Operator
Date Collected: 03/03/2011 09:58
Date Received: 03/03/2011 13:53
Purpose: Routine Monitoring

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Dalapon and Haloacetic						
Bromoacetic acid	Not Detected	03/03/2011	0.001		EPA 552.1/552.2	79-08-3
Bromochloroacetic acid	0.001	03/03/2011	0.001		EPA 552.1/552.2	5589-96-3
Chloroacetic acid	Not Detected	03/03/2011	0.002		EPA 552.1/552.2	79-11-8
Dalapon	Not Detected	03/03/2011	0.001	0.2	EPA 552.1/552.2	75-99-0
Dibromoacetic acid	Not Detected	03/03/2011	0.001		EPA 552.1/552.2	631-64-1
Dichloroacetic acid	0.003	03/03/2011	0.001		EPA 552.1/552.2	79-43-6
Total Haloacetic Acids (five)	0.007	03/03/2011	0.01	0.060	EPA 552.1/552.2	THA-00-C
Trichloroacetic acid	0.004	03/03/2011	0.001		EPA 552.1/552.2	76-03-9
Total Trihalomethanes						
Bromodichloromethane	0.0041	03/08/2011	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	Not Detected	03/08/2011	0.0005	0.080	EPA 524.2	75-25-2
Chlorodibromomethane	0.0020	03/08/2011	0.0005	0.080	EPA 524.2	124-48-1
Chloroform	0.0049	03/08/2011	0.0005	0.080	EPA 524.2	67-66-3
Total Trihalomethanes	0.0110	03/08/2011	0.0005	0.080	EPA 524.2	TTHM-00-C

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contacts
Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt. Unit Mgr: George Krisztian



MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

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

LD59541

Official Laboratory Report

Report To: MIKE GLASGOW
4500 N DORT HWY
FLINT MI 48505

System Name/Owner: CITY OF FLINT
Collection Address: 4500 N DORT HWY, FLINT
Collected By: M GLASGOW
Township/Well#/Section: //
County: Genesee
Sample Point: FILTER EFFLUENT
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310
Source: TYPE I
Site Code:
Collector: Public Water Supply Operator
Date Collected: 11/05/2010 10:00
Date Received: 11/10/2010 14:46
Purpose: Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Antimony	Not detected	11/11/2010	0.0006	0.006	EPA 200.8	7440-36-0
Arsenic	Not detected	11/11/2010	0.002	0.010	EPA 200.8	7440-38-2
Barium	0.04	11/11/2010	0.01	2	EPA 200.8	7440-39-3
Beryllium	Not detected	11/11/2010	0.0004	0.004	EPA 200.8	7440-41-7
Cadmium	Not detected	11/11/2010	0.0003	0.005	EPA 200.8	7440-43-9
Chromium	Not detected	11/11/2010	0.01	0.1	EPA 200.8	7440-47-3
Lead	Not detected	11/11/2010	0.001	0.015	EPA 200.8	7439-92-1
Mercury	Not detected	11/11/2010	0.0001	0.002	EPA 200.8	7439-97-6
Nickel	Not detected	11/11/2010	0.01	0.1	EPA 200.8	7440-02-0
Selenium	0.003	11/11/2010	0.001	0.05	EPA 200.8	7782-49-2
Thallium	Not detected	11/11/2010	0.0002	0.002	EPA 200.8	7440-28-0

Carbamates by HPLC

3 Hydroxycarbofuran	Not Detected	12/01/2010	0.001		EPA 531.2	16655-82-6
Aldicarb	Not Detected	12/01/2010	0.0005		EPA 531.2	116-06-3
Aldicarb sulfone	Not Detected	12/01/2010	0.0005		EPA 531.2	1646-88-4
Aldicarb sulfoxide	Not Detected	12/01/2010	0.0005		EPA 531.2	1646-87-3
Carbaryl	Not Detected	12/01/2010	0.001		EPA 531.2	63-25-2
Carbofuran	Not Detected	12/01/2010	0.0005	0.04	EPA 531.2	1563-66-2
Methiocarb	Not Detected	12/01/2010	0.001		EPA 531.2	2032-65-7
Methomyl	Not Detected	12/01/2010	0.001		EPA 531.2	16752-77-5
Oxamyl	Not Detected	12/01/2010	0.001	0.2	EPA 531.2	23135-22-0
Propoxur	Not Detected	12/01/2010	0.001		EPA 531.2	114-26-1

Chlorinated Acid Herbicides

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 Knsztian

MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

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

LD59541



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Chlorinated Acid Herbicides

2,4,5-T	Not Detected	11/17/2010	0.002		EPA 515.4	93-76-5
2,4,5-TP (silvex)	Not Detected	11/17/2010	0.0003	0.05	EPA 515.4	93-72-1
2,4-D	Not Detected	11/17/2010	0.002	0.07	EPA 515.4	94-75-7
Acifluorfen	Not Detected	11/17/2010	0.004		EPA 515.4	50594-66-6
Bentazon	Not Detected	11/17/2010	0.002		EPA 515.4	25057-89-0
Dicamba	Not Detected	11/17/2010	0.002		EPA 515.4	1918-00-9
Dinoseb	Not Detected	11/17/2010	0.0003	0.007	EPA 515.4	88-85-7
Pentachlorophenol	Not Detected	11/17/2010	0.00006	0.001	EPA 515.4	87-86-5
Picloram	Not Detected	11/17/2010	0.001	0.5	EPA 515.4	1918-02-1
Total DCPA degradates, mono- and di-acid	Not Detected	11/17/2010	0.001		EPA 515.4	1861-32-1

Pesticides Analysis by GC/MS

4,4'-DDD	Not Detected	11/15/2010	0.001		EPA 525.2	72-54-8
4,4'-DDE	Not Detected	11/15/2010	0.001		EPA 525.2	72-55-9
4,4'-DDT	Not Detected	11/15/2010	0.001		EPA 525.2	50-29-3
Acetochlor	Not Detected	11/15/2010	0.001		EPA 525.2	34256-82-1
Alachlor	Not Detected	11/15/2010	0.0002	0.002	EPA 525.2	15972-60-8
Aldrin	Not Detected	11/15/2010	0.0004		EPA 525.2	309-00-2
alpha-Chlordane	Not Detected	11/15/2010	0.0002	0.002	EPA 525.2	5103-71-9
Atrazine	Not Detected	11/15/2010	0.0002	0.003	EPA 525.2	1912-24-9
Dieldrin	Not Detected	11/15/2010	0.0005		EPA 525.2	60-57-1
Endrin	Not Detected	11/15/2010	0.00005	0.002	EPA 525.2	72-20-8
Endrin aldehyde	Not Detected	11/15/2010	0.002		EPA 525.2	7421-93-4
gamma-Chlordane	Not Detected	11/15/2010	0.0002	0.002	EPA 525.2	5103-74-2
Heptachlor	Not Detected	11/15/2010	0.00008	0.0004	EPA 525.2	76-44-8
Heptachlor epoxide	Not Detected	11/15/2010	0.00004	0.0002	EPA 525.2	1024-57-3
Hexachlorobenzene	Not Detected	11/15/2010	0.0001	0.001	EPA 525.2	118-74-1
Hexachlorocyclohexane (alpha-BHC)	Not Detected	11/15/2010	0.001		EPA 525.2	319-84-6
Hexachlorocyclohexane (beta-BHC)	Not Detected	11/15/2010	0.001		EPA 525.2	319-85-7
Hexachlorocyclohexane (delta-BHC)	Not Detected	11/15/2010	0.001		EPA 525.2	319-86-8
Hexachlorocyclopentadiene	Not Detected	11/15/2010	0.0002	0.05	EPA 525.2	77-47-4
Lindane (gamma-BHC)	Not Detected	11/15/2010	0.00004	0.0002	EPA 525.2	58-89-9
Methoxychlor	Not Detected	11/15/2010	0.0001	0.04	EPA 525.2	72-43-5
Metolachlor	Not Detected	11/15/2010	0.001		EPA 525.2	51218-45-2
Metribuzin	Not Detected	11/15/2010	0.001		EPA 525.2	21087-64-9
Molinate	Not Detected	11/15/2010	0.002		EPA 525.2	2212-67-1
PCB (aroclor 1016)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	12674-11-2
PCB (aroclor 1221)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	11104-28-2

CAS#: Chemical Abstract Service Registry Number

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ppm: parts per million

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CFU: Colony Forming Unit

Laboratory Contacts

Drinking Water Unit Mgr: Julia Pieper

Systems Mgmt. Unit Mgr: George Krisztian



MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

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

LD59541

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

Pesticides Analysis by GC/MS

PCB (aroclor 1232)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	11141-16-5
PCB (aroclor 1242)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	53469-21-9
PCB (aroclor 1248)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	12672-29-6
PCB (aroclor 1254)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	11097-69-1
PCB (aroclor 1260)	Not Detected	11/15/2010	0.0001	0.0005	EPA 525.2	11096-82-5
Polybrominated biphenyls	Not Detected	11/15/2010	0.001		EPA 525.2	59536-65-1
Simazine	Not Detected	11/15/2010	0.0002	0.004	EPA 525.2	122-34-9
Toxaphene	Not Detected	11/15/2010	0.001	0.003	EPA 525.2	8001-35-2

Recovery of simazine in the matrix spike was above the acceptable level due to matrix interference.

Volatile Organic Compounds

1,1 Dichloroethane	Not Detected	11/12/2010	0.0005		EPA 524.2	75-34-3
1,1 Dichloroethylene	Not Detected	11/12/2010	0.0005	0.007	EPA 524.2	75-35-4
1,1 Dichloropropene	Not Detected	11/12/2010	0.0005		EPA 524.2	563-58-6
1,1,1 Trichloroethane	Not Detected	11/12/2010	0.0005	0.2	EPA 524.2	71-55-6
1,1,1,2 Tetrachloroethane	Not Detected	11/12/2010	0.0005		EPA 524.2	630-20-6
1,1,2 Trichloroethane	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	79-00-5
1,1,2,2 Tetrachloroethane	Not Detected	11/12/2010	0.0005		EPA 524.2	79-34-5
1,2 Dichlorobenzene	Not Detected	11/12/2010	0.0005	0.6	EPA 524.2	95-50-1
1,2 Dichloroethane	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	107-06-2
1,2 Dichloropropane	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	78-87-5
1,2,3 Trichlorobenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	87-61-6
1,2,3 Trichloropropane	Not Detected	11/12/2010	0.0005		EPA 524.2	96-18-4
1,2,4 Trichlorobenzene	Not Detected	11/12/2010	0.0005	0.07	EPA 524.2	120-82-1
1,2,4 Trimethylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	95-63-6
1,3 Dichlorobenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	541-73-1
1,3 Dichloropropane	Not Detected	11/12/2010	0.0005		EPA 524.2	142-28-9
1,3,5 Trimethylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	108-67-8
1,4 Dichlorobenzene	Not Detected	11/12/2010	0.0005	0.075	EPA 524.2	106-46-7
2,2 Dichloropropane	Not Detected	11/12/2010	0.0005		EPA 524.2	594-20-7
Benzene	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	71-43-2
Bromobenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	108-86-1
Bromochloromethane	Not Detected	11/12/2010	0.0005		EPA 524.2	74-97-5
Bromodichloromethane	0.0028	11/12/2010	0.0005	0.080	EPA 524.2	75-27-4
Bromoform	0.0028	11/12/2010	0.0005	0.080	EPA 524.2	75-25-2
Bromomethane	Not Detected	11/12/2010	0.001		EPA 524.2	74-83-9
Carbon tetrachloride	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	56-23-5
Chlorobenzene	Not Detected	11/12/2010	0.0005	0.1	EPA 524.2	108-90-7
Chlorodibromomethane	0.0059	11/12/2010	0.0005	0.080	EPA 524.2	124-48-1
Chloroethane	Not Detected	11/12/2010	0.0005		EPA 524.2	75-00-3

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 NATURAL RESOURCES AND ENVIRONMENT

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

LD59541



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Volatile Organic Compounds						
Chloroform	0.0010	11/12/2010	0.0005	0.080	EPA 524.2	67-66-3
Chloromethane	Not Detected	11/12/2010	0.0005		EPA 524.2	74-87-3
cis-1,2 Dichloroethylene	Not Detected	11/12/2010	0.0005	0.07	EPA 524.2	156-59-2
cis-1,3 Dichloropropene	Not Detected	11/12/2010	0.0005		EPA 524.2	10061-01-5
Dibromomethane	Not Detected	11/12/2010	0.0005		EPA 524.2	74-95-3
Dichlorodifluoromethane	Not Detected	11/12/2010	0.001		EPA 524.2	75-71-8
Dichloromethane	Not Detected	11/12/2010	0.0006	0.005	EPA 524.2	75-09-2
Ethylbenzene	Not Detected	11/12/2010	0.0005	0.7	EPA 524.2	100-41-4
Fluorotrichloromethane	Not Detected	11/12/2010	0.001		EPA 524.2	75-69-4
Hexachlorobutadiene	Not Detected	11/12/2010	0.0005		EPA 524.2	87-68-3
Isopropylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	98-82-8
m & p-Xylene	Not Detected	11/12/2010	0.0005	10	EPA 524.2	XYLMP-00-C
Methyl ethyl ketone	Not Detected	11/12/2010	0.005		EPA 524.2	78-93-3
Methyl isobutyl ketone	Not Detected	11/12/2010	0.005		EPA 524.2	108-10-1
Methyl-tert-butyl ether (MTBE)	Not Detected	11/12/2010	0.001		EPA 524.2	1634-04-4
Naphthalene	Not Detected	11/12/2010	0.0005		EPA 524.2	91-20-3
n-Butylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	104-51-8
Nitrobenzene	Not Detected	11/12/2010	0.01		EPA 524.2	98-95-3
n-Propylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	103-65-1
o-Chlorotoluene	Not Detected	11/12/2010	0.0005		EPA 524.2	95-49-8
o-Xylene	Not Detected	11/12/2010	0.0005	10	EPA 524.2	95-47-6
p-Chlorotoluene	Not Detected	11/12/2010	0.0005		EPA 524.2	106-43-4
p-Isopropyltoluene	Not Detected	11/12/2010	0.0005		EPA 524.2	99-87-6
sec-Butylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	135-98-8
Styrene	Not Detected	11/12/2010	0.0005	0.1	EPA 524.2	100-42-5
tert-Butylbenzene	Not Detected	11/12/2010	0.0005		EPA 524.2	98-06-6
Tetrachloroethylene	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	127-18-4
Tetrahydrofuran	Not Detected	11/12/2010	0.005		EPA 524.2	109-99-9
Toluene	Not Detected	11/12/2010	0.0005	1	EPA 524.2	108-88-3
Total Trihalomethanes	0.013	11/12/2010	NA	0.080	EPA 524.2	TTHM-00-C
Total Xylenes	Not Detected	11/12/2010	NA	10	EPA 524.2	1330-20-7
trans-1,2 Dichloroethylene	Not Detected	11/12/2010	0.0005	0.1	EPA 524.2	156-60-5
trans-1,3 Dichloropropene	Not Detected	11/12/2010	0.0005		EPA 524.2	10061-02-6
Trichloroethylene	Not Detected	11/12/2010	0.0005	0.005	EPA 524.2	79-01-6
Vinyl chloride	0.0012	11/12/2010	0.0004	0.002	EPA 524.2	75-01-4

A trip blank was not available for analysis with this sample. This sample also contained Acetone at a concentration of 0.03mg/L. (30ppb).

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 NATURAL RESOURCES AND ENVIRONMENT

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

LD59541



TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #

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

City of Flint
X-Connection
Annual Purapage
CCRs



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
2014 WATER SUPPLY CROSS CONNECTION REPORT

Issued under authority of 1976 PA 399, as amended, and the administrative rules.

Failure to submit this form is a violation of the Act and may subject the water supply to enforcement penalties.



ENTERED

Administrative Rule R 325.11405 states in part that "a water utility shall report annually to the department on the status of the cross connection control program on a form provided by the department." Return the completed form by March 31, 2015 to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

WSSN: 2310

- A. Name of water utility: City of Flint County: Genesee
- B. Year that the current written cross connection control program was approved by DEQ: 1974
- C. Total number of industrial, commercial, institutional, residential, and governmental accounts that must be routinely reinspected for cross connections: 2012
Of this number,
- How many are High Hazard accounts: 313 Frequency of Reinspection: Once per Year
- How many are Low Hazard accounts: 1699 Frequency of Reinspection: Once per: 3/Years
- D. Number of accounts from line "C" that received an initial inspection in 2014: 12
- E. Total number of reinspections required and completed in 2014 based on degree of hazard:
- High hazard reinspections required: 313 High hazard reinspections completed: 197
- Low hazard reinspections required: 566 Low hazard reinspections completed: 374
- F. Number of accounts where a cross connection(s) was found to exist during inspections or reinspections in 2014: 41
- G. Number of accounts from line "F" where corrective actions have been completed: 41
- H. Total number of accounts from line "C" which are now in compliance with the local cross connection control program; $H = C - (F - G)$: 2012
- I. Total number of backflow prevention devices in system requiring testing: 1018
- J. Number of backflow prevention devices tested in 2014: 766

Narrative Description of Program

(Outline briefly any changes or significant findings since last reporting; use additional sheets if necessary.)

Budget, and personel constraints as well as added duties for the inspector, continue to be a challenge to the CCC Program in The City. We continue in our effortto move forward.

Name: Glenn Thomas

Title: Cross Connection Control Coordinator

Date: 3/23/2015

APR 01 2015

LAMMING DISTRICT

4 MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
**ANNUAL PUMPAGE/USAGE REPORT FOR COMMUNITY WATER
SUPPLY**



Issued under authority of 1976 PA 399, MCL 325.1001 *et al.*, and Administrative Rules, as amended.

Failure to submit this form is a violation of Act 399 and may subject the water supply to enforcement penalties.

Administrative Rule R 325.11504 states in part that "...each Type I public water supply which does not submit a monthly operation report shall submit an annual report ... of water pumpage and water use." Complete this form and return it to the appropriate Department of Environmental Quality district office **by March 31** following the year covered by the report. For district office addresses, visit www.michigan.gov/deq and click on Locations. Add additional sheets as needed.

Water Supply: City of Flint WSSN: 2310 County: Genesee

MONTHLY PUMPAGE/USAGE

Calendar Year _____	Well No. _____ Capacity in gpm	Well No. _____ Capacity in gpm	Well No. _____ Capacity in gpm	Well No. _____ Capacity in gpm	Total Monthly Pumpage/Usage ☒ in million gallons ☐ in gallons
JANUARY					476.53
FEBRUARY					573.37
MARCH					696.48
APRIL					565.01
MAY					576.89
JUNE					638.70
JULY					580.02
AUGUST					527.35
SEPTEMBER					535.40
OCTOBER					559.70
NOVEMBER					448.00
DECEMBER					467.30

Comments:

Total Yearly Pumpage/Usage

6,644.75

Average Daily Pumpage/Usage
(Total Yearly Pumpage / 365)

18.20

Maximum Daily Pumpage And Date

24.46
Pumpage

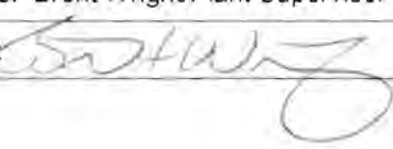
March 5, 2014
Date

Minimum Daily Pumpage And Date

12.5
Pumpage

November 12,
2014
Date

Name/Title: Brent Wright/Plant Supervisor

Signature: 

Date: March 11, 2015



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
2013 WATER SUPPLY CROSS CONNECTION REPORT

Issued under authority of 1976 PA 399, as amended, and the administrative rules.

Failure to submit this form is a violation of the Act and may subject the water supply to enforcement penalties.

Administrative Rule R 325.11405 states in part that "a water utility shall report annually to the department on the status of the cross connection control program on a form provided by the department." Return the completed form by March 31, 2014 to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

WSSN: 2310

- A. Name of water utility: City Of Flint County: Genesee
- B. Year that the current written cross connection control program was approved by DEQ: 1974
- C. Total number of industrial, commercial, institutional, residential, and governmental accounts that must be routinely reinspected for cross connections: 2152
Of this number,
- How many are High Hazard accounts: 311 Frequency of Reinspection: Once per Year
- How many are Low Hazard accounts: 1841 Frequency of Reinspection: Once per: 3 Years
- D. Number of accounts from "C" above that received their initial inspection in 2013: 10
- E. Total number of reinspections required and completed in 2013 based on degree of hazard:
- High hazard reinspections required: 311 High hazard reinspections completed: 229
- Low hazard reinspections required: 613 Low hazard reinspections completed: 484
- F. Number of accounts where a cross connection(s) was found to exist during inspections or reinspections in 2013: 34
- G. Number of accounts from "F" above where corrective actions have been completed: 34
- H. Total number of accounts from "C" above which are now in compliance with the local cross connection control program; $H = C - (F - G)$: 2152
- I. Total number of backflow prevention devices in system requiring testing: 1157
- J. Number of backflow prevention devices tested in 2013: 936

Narrative Description of Program

(Outline briefly any changes or significant findings since last reporting; use additional sheets if necessary.)

Our Backflow Prevention Program continues to utilize all of the resources available to us.

DEQ
RESOURCE MANAGEMENT DIVISION

MAR 18 2014

Name: Glenn Thomas

Title: Cross Connection Control Coordinator Date: 3-10-14



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
2012 WATER SUPPLY CROSS CONNECTION REPORT

Issued under authority of 1976 PA 399, as amended, and the administrative rules.

Failure to submit this form is a violation of the Act and may subject the water supply to enforcement penalties.



Administrative Rule R 325.11405 states in part that "a water utility shall report annually to the department on the status of the cross connection control program on a form provided by the department." Return the completed form by March 31, 2013 to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Contacts.

WSSN: 2310

- A. Name of water utility: City of Flint County: Genesee
- B. Year that the current written cross connection control program was approved by DEQ: 1974
- C. Total number of industrial, commercial, institutional, residential, and governmental accounts that must be routinely reinspected for cross connections: 2235
Of this number,
- How many are High Hazard accounts: 290 Frequency of Reinspection: Once per Year
- How many are Low Hazard accounts: 1945 Frequency of Reinspection: Once per: 3 Years
- D. Number of accounts from "C" above that received their initial inspection in 2012: 16
- E. Total number of reinspections required and completed in 2012 based on degree of hazard:
- High hazard reinspections required: 290 High hazard reinspections completed: 203
- Low hazard reinspections required: 648 Low hazard reinspections completed: 453
- F. Number of accounts where a cross connection(s) was found to exist during inspections or reinspections in 2012: 19
- G. Number of accounts from "F" above where corrective actions have been completed: 19
- H. Total number of accounts from "C" above which are now in compliance with the local cross connection control program; $H = C - (F - G)$: 2235
- I. Total number of backflow prevention devices in system requiring testing: 1136
- J. Number of backflow prevention devices tested in 2012: 1002

Narrative Description of Program

(Outline briefly any changes or significant findings since last reporting; use additional sheets if necessary.)

Budget cuts resulting in staff reductions, have reduced the efficiency of our CCC program for 2012.

We continue to use all resources available to maintain our CCC program.

Name: Glenn Thomas

Title: Cross Connection Control Coordinator

Date: 02/28/2013

DEQ
RESOURCE MANAGEMENT DIVISION

MAR 11 2013

LANSING DISTRICT



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
RESOURCE MANAGEMENT DIVISION

DEQ
RESOURCE MANAGEMENT DIVISION

2011 WATER SUPPLY CROSS CONNECTION REPORT

MAR 07 2012

Issued under authority of 1976 PA 399, as amended, and the administrative rules.

Failure to submit this form is a violation of the Act and may subject the water supply to enforcement penalties.

LANSING DISTRICT

Administrative Rule R 325.11405 states in part that "a water utility shall report annually to the department on the status of the cross connection control program on a form provided by the department." Return the completed form by March 31, 2012 to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Contacts.

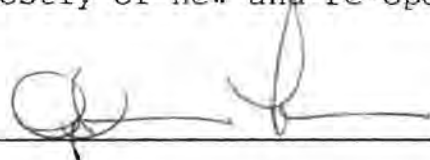
WSSN: 2310

- A. Name of water utility: City of Flint County: Genesee
- B. Year that the current written cross connection control program was approved by DEQ: 1974
- C. Total number of industrial, commercial, institutional, residential, and governmental accounts that must be routinely reinspected for cross connections: 2264
Of this number,
- How many are High Hazard accounts: 303 Frequency of Reinspection: Once per year
- How many are Low Hazard accounts: 1961 Frequency of Reinspection: Once per: 3 yrs.
- D. Number of accounts from "C" above that received their initial inspection in 2011: 26
- E. Total number of reinspections required and completed in 2011 based on degree of hazard:
- High hazard reinspections required: 303 High hazard reinspections completed: 258
- Low hazard reinspections required: 652 Low hazard reinspections completed: 630
- F. Number of accounts where a cross connection(s) was found to exist during inspections or reinspections in 2011: 43
- G. Number of accounts from "F" above where corrective actions have been completed: 43
- H. Total number of accounts from "C" above which are now in compliance with the local cross connection control program; $H = C - (F - G)$: 2060
- I. Total number of backflow prevention devices in system requiring testing: 1201
- J. Number of backflow prevention devices tested in 2011: 1048

Narrative Description of Program

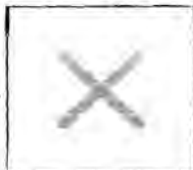
(Outline briefly any changes or significant findings since last reporting; use additional sheets if necessary.)

Our program continues with assistance from the Building Dept. and Water Service Center. Please note that "D" above, consists mostly of new and re-opened businesses.

Name:  Glenn Thomas

g

Title: Cross Connection Control Coordinator Date: 2-29-12



MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT
ENVIRONMENTAL RESOURCE MANAGEMENT DIVISION

2010 WATER SUPPLY CROSS CONNECTION REPORT

Issued under authority of 1976 PA 399, as amended, and the administrative rules.

Failure to submit this form is a violation of the Act and may subject the water supply to enforcement penalties.

Administrative Rule R 325.11405 states in part that "a water utility shall report annually to the department on the status of the cross connection control program on a form provided by the department." Return the completed form by March 31, 2011 to the appropriate Department of Natural Resources and Environment (DNRE) district office. For district office addresses, visit www.michigan.gov/dnre and click on Contacts.

WSSN: 2310

- A. Name of water utility: City of Flint County: Genesee
- B. Year that the current written cross connection control program was approved by DNRE: 1974
- C. Total number of industrial, commercial, institutional, residential, and governmental accounts that must be routinely reinspected for cross connections: 2329
Of this number,
- How many are High Hazard accounts: 305 Frequency of Reinspection: Once per year
- How many are Low Hazard accounts: 2005 Frequency of Reinspection: Once per 3 year
- D. Number of accounts from "C" above that received their initial inspection in 2010: 19
- E. Total number of reinspections required and completed in 2010 based on degree of hazard:
- High hazard reinspections required: 305 High hazard reinspections completed: 260
- Low hazard reinspections required: 668 Low hazard reinspections completed: 609
- F. Number of accounts where a cross connection(s) was found to exist during inspections or reinspections in 2010: 55
- G. Number of accounts from "F" above where corrective actions have been completed: 55
- H. Total number of accounts from "C" above which are now in compliance with the local cross connection control program; $H = C - (F - G)$: 1958
- I. Total number of backflow prevention devices in system requiring testing: 1157
- J. Number of backflow prevention devices tested in 2010: 903

Narrative Description of Program

(Outline briefly any changes or significant findings since last reporting; use additional sheets if necessary.)

The most prevalent CCC violation in the City of Flint continues to be missing hose bib vacuum breakers. Reinstatement of clerical support for the cities CCC program improve our efficiency in 2011.

Waste & Hazardous
Materials Division

APR 01 2011

Lansing District

Name:  Glenn Thomas

Title: Cross Connection Control Coordinator Date: 3-18-11

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 RESOURCE MANAGEMENT DIVISION
**ANNUAL PUMPAGE/USAGE REPORT FOR COMMUNITY WATER
 SUPPLY**



Issued under authority of 1976 PA 399 and Administrative Rules, as amended.

Failure to submit this form is a violation of the Act and may subject the water supply to enforcement penalties.

Administrative Rule R 325.11504 states in part that "...each Type I public water supply which does not submit a monthly operation report shall submit an annual report ... of water pumpage and water use." Complete this form and return it to the appropriate Department of Environmental Quality district office by March 31 following the year covered by the report. For district office addresses, visit www.michigan.gov/deq and click on Locations. Add additional sheets as needed.

Water Supply: City of Flint WSSN: 2310 County: Genesee

MONTHLY PUMPAGE/USAGE

Calendar Year <u>2013</u>	Well No. _____ Capacity in gpm	Well No. _____ Capacity in gpm	Well No. _____ Capacity in gpm	Well No. _____ Capacity in gpm	Total Monthly Pumpage/Usage ☒ in million gallons ☐ in gallons
JANUARY					427.48
FEBRUARY					437.15
MARCH					451.73
APRIL					406.77
MAY					416.28
JUNE					382.82
JULY					418.97
AUGUST					408.18
SEPTEMBER					392.54
OCTOBER					399.25
NOVEMBER					362.82
DECEMBER					397.15

COMMENTS:

TOTAL YEARLY PUMPAGE/USAGE

4901.14

AVERAGE DAILY PUMPAGE/USAGE
 (Total Yearly Pumpage / 365)

13.43

MAXIMUM DAILY PUMPAGE AND DATE

17.37
Pumpage

Feb. 20
Date

MINIMUM DAILY PUMPAGE AND DATE

10.00
Pumpage

Nov. 15
Date

Name/Title: Brent F. Wright Water Plant Supervisor

Signature: [Signature] Date: March 10, 2014

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 RESOURCE MANAGEMENT DIVISION
**ANNUAL PUMPAGE/USAGE REPORT FOR COMMUNITY WATER
 SUPPLY**



Issued under authority of 1976 PA 399 and Administrative Rules, as amended.

Failure to submit this form is a violation of the Act and may subject the water supply to enforcement penalties.

Administrative Rule R 325.11504 states in part that "...each Type I public water supply which does not submit a monthly operation report shall submit an annual report ... of water pumpage and water use." Complete this form and return it to the appropriate Department of Environmental Quality district office by March 31 following the year covered by the report. For district office addresses, visit www.michigan.gov/deq and click on Contacts. Add additional sheets as needed.

Water Supply: City of Flint WSSN: 2310 County: Genesee

MONTHLY PUMPAGE/USAGE

Calendar Year <u>2012</u>	Well No. _____ Capacity in gpm	Well No. _____ Capacity in gpm	Well No. _____ Capacity in gpm	Well No. _____ Capacity in gpm	Total Monthly Pumpage/Usage ☒ in million gallons ☐ in gallons
JANUARY					359.64
FEBRUARY					355.78
MARCH					362.31
APRIL					353.23
MAY					399.59
JUNE					378.65
JULY					430.71
AUGUST					381.29
SEPTEMBER					335.76
OCTOBER					331.69
NOVEMBER					342.26
DECEMBER					374.35

DEQ
 RESOURCE MANAGEMENT DIVISION
 MAR 11 2013
 LANSING DISTRICT

COMMENTS:

We had a max day of 22.45
 on May 5th and a min day of
 5.27 on May 2nd. These days
 occurred during a repair on the 72"
 transmission main.

TOTAL YEARLY PUMPAGE/USAGE

4405.26

AVERAGE DAILY PUMPAGE/USAGE
 (Total Yearly Pumpage / 365)

12.07

MAXIMUM DAILY PUMPAGE AND DATE

17.82

7/02/12

Pumpage

Date

MINIMUM DAILY PUMPAGE AND DATE

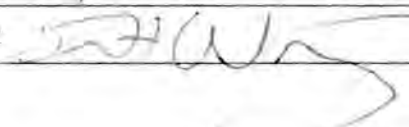
7.07

10/18/12

Pumpage

Date

Name/Title: Brent F. Wright Plant Supervisor

Signature: 

Date: 2/01/2013

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
RESOURCE MANAGEMENT DIVISION
**ANNUAL PUMPAGE/USAGE REPORT FOR COMMUNITY WATER
SUPPLY**

Issued under authority of 1976 PA 399 and Administrative Rules, as amended.

Failure to submit this form is a violation of the Act and may subject the water supply to enforcement penalties.

Administrative Rule R 325.11504 states in part that "...each Type I public water supply which does not submit a monthly operation report shall submit an annual report ... of water pumpage and water use." Complete this form and return it to the appropriate Department of Environmental Quality district office by March 31 following the year covered by the report. For district office addresses, visit www.michigan.gov/deq and click on Contacts. Add additional sheets as needed.

Water Supply: Flint WSSN: 2310 County: Genesee

MONTHLY PUMPAGE/USAGE

Calendar Year <u>2011</u>	Well No. Capacity in gpm	Well No. Capacity in gpm	Well No. Capacity in gpm	Well No. Capacity in gpm	Total Monthly Pumpage/Usage ☒ in million gallons ☐ in gallons
JANUARY					484.43
FEBRUARY					495.24
MARCH					458.89
APRIL					431.92
MAY					438.51
JUNE					463.10
JULY					458.33
AUGUST					406.97
SEPTEMBER					385.44
OCTOBER					360.42
NOVEMBER					344.62
DECEMBER					353.06

COMMENTS:

TOTAL YEARLY PUMPAGE/USAGE

5080.93

AVERAGE DAILY PUMPAGE/USAGE
(Total Yearly Pumpage / 365)

13.92

MAXIMUM DAILY PUMPAGE AND DATE

20.41
Pumpage

2/19/2011
Date

MINIMUM DAILY PUMPAGE AND DATE

9.01
Pumpage

12/26/2011
Date

Name/Title: <u>Brent F. Wright</u>	Water Plant Supervisor
Signature: 	Date: <u>1/11/2012</u>

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
RESOURCE MANAGEMENT DIVISION



**ANNUAL PUMPAGE/USAGE REPORT FOR COMMUNITY WATER
SUPPLY**

Issued under authority of 1976 PA 399 and Administrative Rules, as amended.

Failure to submit this form is a violation of the Act and may subject the water supply to enforcement penalties.

Administrative Rule R 325.11504 states in part that "...each Type I public water supply which does not submit a monthly operation report shall submit an annual report ... of water pumpage and water use." Complete this form and return it to the appropriate Department of Environmental Quality district office by March 31 following the year covered by the report. For district office addresses, visit www.michigan.gov/deq and click on Contacts. Add additional sheets as needed.

Water Supply: City of Flint WSSN: 2310 County: Genesee

MONTHLY PUMPAGE/USAGE

Calendar Year <u>2010</u>	Well No. Capacity in gpm	Well No. Capacity in gpm	Well No. Capacity in gpm	Well No. Capacity in gpm	Total Monthly Pumpage/Usage ☒ in million gallons ☐ in gallons
JANUARY					420.23
FEBRUARY					400.21
MARCH					448.65
APRIL					413.78
MAY					425.12
JUNE					424.92
JULY					461.80
AUGUST					470.87
SEPTEMBER					419.49
OCTOBER					411.40
NOVEMBER					392.50
DECEMBER					455.61

COMMENTS:

TOTAL YEARLY PUMPAGE/USAGE 5,144.58

AVERAGE DAILY PUMPAGE/USAGE
(Total Yearly Pumpage / 365) 14.09

MAXIMUM DAILY PUMPAGE AND DATE 17.50 12/11/10
Pumpage Date

MINIMUM DAILY PUMPAGE AND DATE 10.95 11/26/10
Pumpage Date

Name/Title: Michael Glasgow, Laboratory & Water Quality Supervisor (OIC)

Signature: Michael Glasgow Date: 3/17/2011



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
**CONSUMER CONFIDENCE REPORT FOR COMMUNITY WATER SUPPLY
CERTIFICATE OF DISTRIBUTION**

Issued under authority of 1976 PA 399 and Administrative Rules, as amended.

Failure to submit certification is a violation of the Act and may subject the water supply to enforcement penalties.

Supply Name: City of Flint	County: Genesee	WSSN: 2310
Population: ☐ 500 or fewer people	☐ 501 – 9,999 people	☒ 10,000 or more people

Community water supplies must confirm that the Consumer Confidence Report (CCR) and any enclosed Public Notices (PN) or notices of CCR availability, have been distributed to customers by July 1 as required under administrative rules R 325.10415 and R 325.10404(4)(c). Supplies must also certify that the information contained in the CCR is correct and consistent with the compliance monitoring data previously submitted to the Michigan Department of Environmental Quality (DEQ). **Return the certification to the appropriate DEQ district office by October 1.** For addresses, visit www.michigan.gov/deg, click on Locations.

Method of delivery to DEQ	
☒ Mail ☐ Email ☐ Hand Delivery ☐ Other _____	Date delivered: September 8, 2015
Method of delivery to Local Health Department	
☐ Mail ☐ Email ☒ Hand Delivery ☐ Other _____	Date delivered: July 20, 2015
Method or combination of methods to directly deliver CCR to each bill paying customer. Check all that apply.	
☒ Mail or hand deliver a paper copy of CCR. Date(s) mailed or hand delivered: July 17, 2015	
☐ Mail or hand deliver notification that the CCR is available at a direct URL. Date(s) delivered to customers: _____	
☐ Email notification that CCR is available at direct URL: Date(s) emailed: _____	
☐ Email notification that CCR is attached to the email. Date(s) emailed: _____	
☐ Email notification that CCR is embedded in the email. Date(s) emailed: _____	
If using notification of CCR availability:	
1. Mail a paper CCR to customers who request it and to customers known to be incapable of receiving electronically.	
2. Include a copy of the notification to the DEQ district office with this certification form.	
3. Explain the nature of the notification, prominently display the direct URL, include statement how to request a paper copy.	
Example of Notification of CCR Availability Subject Line: 2012 Drinking Water Quality Report Available. Message: Your annual report on the source and quality of your drinking water is available on the Web at www.anytown.gov/waterqualityreport. To have a copy mailed to you, contact Anytown at 555-111-1111 or water@anytown.gov.	
☐ Option for supplies serving fewer than 10,000 persons: Publish entire report in newspaper, and notify customers via newspaper(s) in which CCR published, mail, email or hand delivery that individual copies will not be mailed, and include statement how to request a paper copy. Date(s) of publication: _____	
☐ Option for supplies serving 500 or fewer persons: Notify customers via mail, email, hand delivery or, with DEQ approval, posting in public places, that a copy of the report is available from the water supply on request. Date(s) of notification: _____	

Post on Internet (required for supplies serving $\geq 100,000$, optional for others)	
☒ Internet address: https://www.cityofflint.com/wp-content/uploads/CCR-2014.pdf	Date accessible: July 1, 2015

"Good Faith" efforts to reach non-bill-paying consumers (in addition to the method(s) above). Check all that apply.	
☐ Mail the report to all postal patrons. Zip codes and dates mailed: _____	
☒ Mail to each service connection physical address. Date(s) mailed: July 17, 2015	
☐ Advertise the availability of the report in the newspapers, on TV, and on the radio.	
☐ Publish the report in a local newspaper.	
☐ Post the report in public places such as cafeterias in public buildings, libraries, churches, and schools.	
☐ Deliver multiple copies for distribution by single-bill customers, e.g., apartments or private employers.	
☐ Deliver the report to community organizations.	
☐ Other: _____	
Send to the DEQ a copy of the news articles, a list of channels broadcast and dates, and a list of locations/organizations reports delivered to and dates.	

A Tier 3 Public Notice is Distributed with this CCR	
☒ This CCR is being used to deliver a Tier 3 Public Notice for one or more violations. To use this Tier 3 delivery option, the CCR must be directly delivered to each bill paying customer or, with DEQ approval, continuously posted, and must be issued within 12 months of learning of the violation. A copy of this form must be delivered to the DEQ within 10 days of delivering the CCR to customers to meet the public notification requirements.	

Name/Title: Brent Wright Supervisor	Date: September 8, 2015
Signature:	

See reverse side for U.S. EPA Expectations for Electronic Delivery of CCR

Flint River



FINT



The Consumers Annual Water Quality Report provides important information about your drinking water. This report includes information about the source of the water, health information, a chart summarizing regulatory required testing results, and a table giving explanations of important terms to understand when viewing the test results. The City of Flint Department of Utilities is dedicated to providing quality drinking water to the residents of the community. The Flint Water Plant operates and maintains a certified drinking water laboratory to assure compliance with all state and federal regulations, and is committed to prompt and thorough notification to the consumers if there is any reason for concern about the quality of the drinking water. Information about your drinking water is available on the City of Flint web page at www.cityofflint.com or by calling the City of Flint Water Plant at (810) 787-6537. The Safe Drinking Water Hotline at (800) 426-4791 is a resource for health related questions and water quality issues. General drinking water information can also be found on the USEPA web site at www.epa.gov/safewater/.

Water Source

The City of Flint began using the Flint River as a water source in May of 2014. Flint is located roughly in the middle of the Flint River Watershed. The Flint River watershed includes Holloway Reservoir, C.S. Mott Lake, Kearsley Lake, and numerous streams and creeks that drain to these lakes or directly into the Flint River. The Michigan Department of Environmental Quality in partnership with the U.S. Geological Survey, and the City of Flint Utilities Department conducted a source water assessment in February 2004 to determine the susceptibility of potential contamination. The susceptibility rating is a seven-tiered scale ranging from “very low” to “very high” based primarily on geologic sensitivity, water chemistry, and contaminant sources. The Flint River source water intake is categorized as having a very high susceptibility to potential contaminant sources.

The use of the Flint River as a source water for the City of Flint Water Treatment Plant was a temporary move, driven largely by economics and the financial state of the City. The City of Flint joined the Karegnondi Water Authority (KWA) in 2010. The KWA consists of a group of local communities that decided to support and fund construction of a raw water pipeline to Lake Huron. The KWA will provide the City of Flint Water Treatment Plant with source water from Lake Huron. The KWA pipeline is currently under construction, and is scheduled to be completed by the end of 2016.



KWA pipeline construction

General Information

In order to ensure that tap water is safe to drink, the EPA prescribes regulations, which limit the amount of certain contaminants in water provided by the public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- ♦ **Microbial contaminants**; such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- ♦ **Inorganic contaminants**; such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- ♦ **Pesticides and herbicides**; which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- ♦ **Organic chemical contaminants**; including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- ♦ **Radioactive contaminants**; which can be naturally occurring or be the result of oil and gas production and mining activities.

General Information (cont.)

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that the lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Flint Department of Utilities is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. If you are concerned about elevated lead levels in your home's water, you can minimize your potential exposure to lead in your water by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

2014 & Current Drinking Water Issues

The City of Flint did experience drinking water issues in the summer of 2014. Issues began with areas of the city experiencing "rusty" water. This was largely due to the fact that the city distribution system contains hundreds of miles of cast iron pipe. As these pipes age and degrade, iron is released, causing the water to exhibit color. The change in source water, water main breaks, and routine maintenance to the system also contributed to this problem.

The City of Flint received violations from the Michigan Department of Environmental Quality (MDEQ). The violations included a total coliform and *E. coli* in August and September of 2014, and a corresponding total trihalomethanes (TTHM) violation in December of the same year. As the city distribution system testing began to detect bacteria, system flushing increased, and chlorine addition to the water at the treatment plant also increased. The resulting increased chlorine addition then resulted in the higher formation of trihalomethanes.

While facing these issues, the City of Flint took steps to confer with industry professionals and state regulators in regards to treatment plant operation and distribution system operation. In November, TTHM levels were below the Maximum contaminant level set forth in the Michigan Safe Drinking Water Act.

Moving Forward

The City of Flint has taken many steps to correct the underlying issues that resulted in the drinking water violations. Water Treatment Plant corrective actions that were taken immediately after the issues occurred included:

- Limiting the use of storage reservoirs during the warm weather months.
 - Warm water temperatures and water age are large contributors to the formation of THM's.
- Optimizing ozone pretreatment by updating control programming along with cleaning and inspection of the ozone generators.
 - Ozone is a powerful oxidant that provides a level of disinfection along with taste and odor control.
- Currently finalizing the installation of granular activated carbon (GAC) to the filtration process, which should be complete by the end of July 2015.
 - GAC will reduce THM's by removing the chemical precursors that react with chlorine to form the THM's.

Moving Forward (cont.)

Distribution system corrective actions that were enacted include:

- Increased water main flushing in an effort to alleviate stagnant water.
- Update distribution system water hydraulic model, to determine possible problem areas.
- Repaired or replaced several large water main valves, which were inhibiting the designed flow of water through the system.
- Planning and budgeting of 24" transmission water main repair in area of concern in the distribution system.
- Begin a complete distribution system evaluation of the 7000 water main valves that control the flow of water throughout the city. This project will be complete in July of 2015 and will provide information on where to proceed with further repairs and future projects.

The City of Flint is dedicated to resolving the issues that are facing the water system, and will continue to move forward as we prepare for the future. The City would like to thank all the residents and customers for their patience and understanding as we face the challenges ahead. The trials and tribulations that we have faced with the switch to the Flint River as a source water will prove to be important as we move ahead as a member of the KWA. Some of the distribution system issues experienced in 2014 while using the Flint River may also have been experienced with a different source water. As we continue to address the issues and take steps to be proactive, we can assure a future of quality drinking water in the City of Flint.



If you have any questions about this report or other concerns please contact the City of Flint Water Plant (810) 787-6537.

2014 Regulated Detected Contaminants Monitored at Treatment Plant

Regulated Contaminant	Unit of Measure	MCLG	MCL	Highest Level Detected	Range of Detection	Violation
Inorganic Chemicals						
Fluoride	mg/L	4	4			No
Nitrate	mg/L	10	10	0.5	0 – 0.5	No
Metals						
Barium	mg/L	2	2	0.03	0.02 – 0.03	No
Selenium	mg/L	0.05	0.05	0.001	0 – 0.001	No
Pesticides						
Atrazine	mg/L	0.03	0.03	0.0003	0 – 0.0003	No
Organics						
Total Xylenes	mg/L	10	10	0.0005	0 – 0.0005	No

More than 100 other chemicals were monitored throughout the year that were not detected. The list of various classifications these chemicals are associated with include metals, carbamates, herbicides, pesticides, organics, and radiological.

Total Organic Carbon, TOC			
Regulated Contaminant	Required Monthly % Removal	Minimum Monthly % Removal	Monthly % Removal Ranges
Total Organic Carbon	50	53	53 – 68

Finished water and Source water samples are collected and analyzed monthly to calculate percent removal. Total organic carbon includes numerous chemicals that are found naturally in surface waters. Certain chemicals found in this group are precursors to the disinfection byproducts trihalomethanes and haloacetic acids.

Turbidity		
Highest Single Measurement (Cannot exceed 1NTU)	Lowest Monthly % of Samples Meeting Turbidity Limit (< 0.3 NTU in 95% of samples)	Violation
0.22	99.1	No

Turbidity is a measure of the apparent cloudiness of water, usually attributed to particulate matter. The turbidity data in the chart above is measured from the water plant tap every 4 hours. Turbidity is monitored throughout each stage of the treatment process in 4 hour intervals, and in one of the final stages of treatment, filtration, turbidity is monitored continuously with in line meters, and verified every 4 hours in the laboratory.

In 2014, the EPA required the City of Flint and other communities to conduct further testing on unregulated contaminants at the treatment plant and the maximum residence time in the distribution system. The monitoring results will be utilized by the EPA to determine if these chemicals should be regulated. The unregulated contaminant monitoring that yielded results are presented in the chart below

Unregulated Contaminant Monitoring			
Regulated Contaminant	Unit of Measure	Highest Level Detected	Range of Detection
Chromium	ug/L	0.40	0 – 0.4
Hexavalent Chromium	ug/L	0.40	0.34 – 0.40
Strontium	ug/L	130	120 – 130
Vanadium	ug/L	0.20	0 – 0.20

2014 Regulated Detected Contaminants Monitored in Distribution System

Disinfectant Residuals						
Regulated Contaminant	Unit of Measure	MCLG	MCL	Highest Level Detected	Range of Detection	Violation
Total Chlorine Residual	mg/L	4.0	4.0	3.5	0.1 – 3.5	No

Microbiological Contaminants				
Regulated Contaminant	MCL G	MCL	Highest Number detected (in 1 month)	Violation
Total Coliform bacteria	0	The presence of coliform bacteria in > 5% of monthly samples	15	Yes
<i>E. coli</i> Bacteria	0	0	1	Yes

Disinfectant residuals and microbiological contaminants are monitored at 8 locations throughout the city distribution system, and at the 2 drinking water reservoirs and pump stations located out in the distribution system. At least 100 samples are collected and analyzed each month.

Lead & Copper						
Regulated Contaminant	Unit of Measure	MCLG	Action Level AL	90 th Percentile Value	Number of samples over AL	Violation
Lead	ug/L	0	15	6	2	No
Copper	mg/L	1.3	1.3	0.11	0	No

Lead and copper monitoring was conducted from June through December 2014 with the collection of 100 samples. Samples were collected by residents from the taps at their residence. Thank you to all who participated in collecting samples.

Disinfection By-Products						
Regulated Contaminant	Unit of Measure	MCL G	MCL	Highest Level Detected	Range of Detection	Violation
Total Trihalomethanes (TTHM)	ug/L	n/a	80	196	33.3 -196.2	Yes
Haloacetic Acids (HAA)	ug/L	n/a	60	64	5 - 64	No
Bromate	ug/L	10	10	23	0 - 23	No

Disinfection by-products occur as a result of the water treatment process. Bromate is formed as a result of using ozone as a treatment additive. Ozone is used to help control taste and odor issues, and as a pre-treatment disinfection. Naturally occurring bromide reacts with Ozone to generate bromate. Bromate is monitored monthly, and compliance is based on a yearly average.

TTHM's and HAA's are formed as a result of utilizing chlorine in the treatment process. Naturally occurring compounds known as TOC's (total organic carbon) react with chlorine to form TTHM's and HAA's. The temperature and the age of water increase the formation of THM's and HAA's, and as a result, during the warm months of the year is when levels were at their highest. Samples are tested quarterly from 8 sites throughout the distribution system and compliance is based on a running annual average at each individual site.

Key to the Detected Contaminant Tables

Symbol	Abbreviation for	Definition/Explanation
>	Greater than	
AL	Action Level	The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements which a water system must follow.
HAA5	Haloacetic Acids	HAA5 is the total of bromoacetic, chloroacetic, dibromoacetic, dichloroacetic, and trichloroacetic acids. Compliance is based on the total.
LRAA	Locational Running Annual Average	
MCL	Maximum Contaminant Level	The highest level of a contaminant that is allowed in d water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MCLG	Maximum Contaminant Level Goal	The level of contaminant in drinking water below which there is no known or expected risk to health.
mg/L	Milligrams per Liter	A milligram = 1/1000 gram 1 milligram per liter is equal to 1ppm
MRDL	Maximum Residual Disinfectant Level	The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MRDLG	Maximum Residual Disinfectant Level Goal	The level of a drinking water disinfectant below which there is no known or expected risk to health. MRLDG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.
n/a	Not Applicable	
ND	Not Detected	
NTU	Nephelometric Turbidity Units	Measures the cloudiness of water.
pCi/L	Picocuries per Liter	A measure of radioactivity. Picocurie (pCi) means the quantity of radioactive material producing 2.22 nuclear transformations per minute.
ppb	Parts Per Billion (one in one billion)	The ppb is equivalent to micrograms per liter. A microgram = 1/1000 milligram.
ppm	Parts Per Million (one in one million)	The ppm is equivalent to milligrams per liter. A milligram = 1/1000 gram.
RAA	Running Annual Average	
TT	Treatment Technique	A required process intended to reduce the level of a contaminant in drinking water.
TTHM	Total Trihalomethanes	Total Trihalomethanes is the sum of chloroform, bromodichloromethane, dibromochloromethane and bromoform. Compliance is based on total.
ug/L	Micrograms per Liter	A microgram = 1/1,000,000 gram 1 microgram per liter is equal to 1ppb



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
**CONSUMER CONFIDENCE REPORT FOR COMMUNITY WATER SUPPLY
CERTIFICATE OF DISTRIBUTION**

Issued under authority of 1976 PA 399 and Administrative Rules, as amended.

Failure to submit certification is a violation of the Act and may subject the water supply to enforcement penalties.

Supply Name: City of Flint	County: Genesee	WSSN: 2310
Population: ☐ 500 or fewer people	☐ 501 – 9,999 people	☒ 10,000 or more people

Community water supplies must confirm that the Consumer Confidence Report (CCR) and any enclosed Public Notices (PN) or notices of CCR availability, have been distributed to customers by July 1 as required under administrative rules R 325.10415 and R 325.10404(4)(c). Supplies must also certify that the information contained in the CCR is correct and consistent with the compliance monitoring data previously submitted to the Michigan Department of Environmental Quality (DEQ). **Return the certification to the appropriate DEQ district office by October 1.** For addresses, visit www.michigan.gov/deq, click on Locations.

Method of delivery to DEQ	
☒ Mail ☐ Email ☐ Hand Delivery ☐ Other _____	Date delivered: <u>September 8, 2015</u>
Method of delivery to Local Health Department	
☐ Mail ☐ Email ☒ Hand Delivery ☐ Other _____	Date delivered: <u>June 30, 2015</u>
Method or combination of methods to directly deliver CCR to each bill paying customer. Check all that apply.	
☒ Mail or hand deliver a paper copy of CCR. Date(s) mailed or hand delivered: <u>June 29, 2015</u>	
☐ Mail or hand deliver notification that the CCR is available at a direct URL. Date(s) delivered to customers: _____	
☐ Email notification that CCR is available at direct URL. Date(s) emailed: _____	
☐ Email notification that CCR is attached to the email. Date(s) emailed: _____	
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2. Include a copy of the notification to the DEQ district office with this certification form.	
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Example of Notification of CCR Availability Subject Line: 2012 Drinking Water Quality Report Available. Message: Your annual report on the source and quality of your drinking water is available on the Web at www.anytown.gov/waterqualityreport. To have a copy mailed to you, contact Anytown at 555-111-1111 or water@anytown.gov.	
☐ Option for supplies serving fewer than 10,000 persons: Publish entire report in newspaper, and notify customers via newspaper(s) in which CCR published, mail, email or hand delivery that individual copies will not be mailed, and include statement how to request a paper copy. Date(s) of publication: _____	
☐ Option for supplies serving 500 or fewer persons: Notify customers via mail, email, hand delivery or, with DEQ approval, posting in public places, that a copy of the report is available from the water supply on request. Date(s) of notification: _____	
Post on Internet (required for supplies serving ≥100,000, optional for others)	
☐ Internet address: _____	Date accessible: _____
"Good Faith" efforts to reach non-bill-paying consumers (in addition to the method(s) above). Check all that apply.	
☐ Mail the report to all postal patrons. Zip codes and dates mailed: _____	
☒ Mail to each service connection physical address. Date(s) mailed: <u>June 29, 2015</u>	
☐ Advertise the availability of the report in the newspapers, on TV, and on the radio.	
☐ Publish the report in a local newspaper.	
☐ Post the report in public places such as cafeterias in public buildings, libraries, churches, and schools.	
☐ Deliver multiple copies for distribution by single-bill customers, e.g., apartments or private employers.	
☐ Deliver the report to community organizations.	
☐ Other: _____	
Send to the DEQ a copy of the news articles, a list of channels broadcast and dates, and a list of locations/organizations reports delivered to and dates.	
A Tier 3 Public Notice is Distributed with this CCR	
☐ This CCR is being used to deliver a Tier 3 Public Notice for one or more violations. To use this Tier 3 delivery option, the CCR must be directly delivered to each bill paying customer or, with DEQ approval, continuously posted, and must be issued within 12 months of learning of the violation. A copy of this form must be delivered to the DEQ within 10 days of delivering the CCR to customers to meet the public notification requirements.	
Name/Title: Brent Wright	Supervisor
Signature:	Date: September 8, 2015

See reverse side for U.S. EPA Expectations for Electronic Delivery of CCR

Detroit



**City of Flint
Water Plant & Facilities**

2014 Consumers Annual Report on Water Quality

The City of Flint Department of Utilities is dedicated to providing high quality drinking water to the residents of the community. The Consumers Annual Report on Water Quality provides important information about your drinking water. This report includes information about the source of the water, health information, a chart summarizing United States Environmental Protection Agency (USEPA) required testing results, and a table giving explanations of important terms to understand when viewing the test results. The Flint Water Plant & Facilities operates and maintains a certified drinking water laboratory to assure compliance with all state and federal regulations and is committed to prompt and thorough notification to the consumers if there is any reason for concern about the quality of the drinking water.

Information about your drinking water is available at the City of Flint web page on the Internet at www.cityofflint.com or by calling the Flint Water Plant & Facilities at (810) 787-6537. The Safe Drinking Water Hotline at (800) 426-4791 is a resource for health related questions and water quality issues. General drinking water information can be found on the USEPA web site at www.epa.gov/safewater/.

Water Source

From January 1st through April 20th 2014, The City of Flint purchased drinking water from the Detroit Water & Sewerage Department (DWSD) which operates several drinking water facilities. Following treatment to remove impurities, the water is pumped by DWSD to the Flint Water Plant, where the water is then monitored and distributed throughout the City.

The source water comes from the lower Lake Huron watershed. The watershed includes numerous short, seasonal streams that drain to Lake Huron. The Michigan Department of Environmental Quality in partnership with the U.S. Geological Survey, the Detroit Water & Sewerage Department, and the Michigan Public Health Institute performed a source water assessment in 2004 to determine the susceptibility of potential contamination. The susceptibility rating is a seven-tiered scale ranging from "very low" to "very high" based primarily on geologic sensitivity, water chemistry, and contaminant sources. The Lake Huron source water intake is categorized as having a moderately low susceptibility to potential contaminant sources. The Lake Huron water treatment plant has historically provided satisfactory treatment of this source water to meet drinking water standards. If you would like to know more information or a complete copy of the report, contact the City of Flint Water Plant at (810) 787-6537.

General Information

In order to ensure that tap water is safe to drink, the EPA prescribes regulations, which limit the amount of certain contaminants in water provided by the public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- ♦ **Microbial contaminants;** such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- ♦ **Inorganic contaminants;** such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- ♦ **Pesticides and herbicides;** which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- ♦ **Organic chemical contaminants;** including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- ♦ **Radioactive contaminants;** which can be naturally occurring or be the result of oil and gas production and mining activities.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that the lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Flint Department of Utilities is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. If you are concerned about elevated lead levels in your home's water, you can minimize your potential exposure to lead in your water by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

Lake Huron Water Treatment Plant 2014 Regulated Detected Contaminants Tables

Regulated Contaminant	Test Date	Unit	Health Goal MCLG	Allowed Level MCL	Highest Level Detected	Range of Detection	Violation yes/no	Major Sources in Drinking Water
Inorganic Chemicals – Monitoring at the Plant Finished Water Tap								
Fluoride	5/13/14	ppm	4	4	0.59	n/a	No	Erosion of natural deposits; Water additive, which promotes strong teeth; Discharge from fertilizer and aluminum factories.
Nitrate	5/13/14	ppm	10	10	0.31	n/a	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
Disinfection By-Products – Monitoring in Distribution System Stage 2 Disinfection By-Products								
Regulated Contaminant	Test Date	Unit	Health Goal MCLG	Allowed Level MCL	Highest LRAA	Range of Detection	Violation yes/no	Major Sources in Drinking Water
Total Trihalomethanes (TTHM)	2014	ppb	n/a	80	33.0	10.0 - 48.5	No	By-product of drinking water chlorination
Haloacetic Acids (HAA5)	2014	ppb	n/a	60	15.8	8.0 - 19.0	No	By-product of drinking water disinfection
Disinfectant Residuals Monitoring in DWSD Distribution System								
Regulated Contaminant	Test Date	Unit	Health Goal MRDGL	Allowed Level MRDL	Highest RAA	Range of Detection	Violation yes/no	Major Sources in Drinking Water
Total Chlorine Residual	Jan-Dec 2014	ppm	4	4	0.82	0.64-0.94	No	Water additive used to control microbes
Regulated Contaminant	Treatment Technique							Typical Source of Contaminant
Total Organic Carbon (ppm)	The Total Organic Carbon (TOC) removal ratio is calculated as the ratio between the actual TOC removal and the TOC removal requirements. The TOC was measured each month and because the level was low, there is no requirement for TOC removal.							Erosion of natural deposits

2014 Turbidity – Monitored every 4 hours at Plant Finished Water Tap

Highest Single Measurement Cannot exceed 1 NTU	Lowest Monthly % of Samples Meeting Turbidity Limit of 0.3 NTU (minimum 95%)	Violation yes/no	Major Sources in Drinking Water
0.19 NTU	100%	No	Soil Runoff

Turbidity is a measure of the cloudiness of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.

2014 Microbiological Contaminants – Monthly Monitoring in Distribution System

Regulated Contaminant	MCLG	MCL	Highest Number Detected	Violation yes/no	Major Sources in Drinking Water
Total Coliform Bacteria	0	Presence of Coliform bacteria > 5% of monthly samples	0	No	Naturally present in the environment.
E.coli Bacteria	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal or E. coli positive.	0	No	Human waste and animal fecal waste.

2011 Lead and Copper Monitoring at Customers' Tap

Regulated Contaminant	Test Date	Unit	Health Goal MCLG	Action Level AL	90 th Percentile Value*	Number of Samples Over AL	Violation yes/no	Major Sources in Drinking Water
Lead	2011	ppb	0	15	< 2.0	0	No	Corrosion of household plumbing system; Erosion of natural deposits.
Copper	2011	ppm	1.3	1.3	0.10	0	No	Corrosion of household plumbing system; Erosion of natural deposits; Leaching from wood preservatives.

*The 90th percentile value means 90 percent of the homes tested have lead and copper levels below the given 90th percentile value. If the 90th percentile value is above the AL additional requirements must be met.

2014 Radionuclides

Regulated Contaminant	Test Date	Unit	Health Goal MCLG	Allowed Level MCL	Level Detected	Violation yes/no	Major Sources in Drinking Water
Combined Radium Radium 226 & 228	5/13/14	pCi/L	0	5	0.86 + or - 0.55	No	Erosion of natural deposits

014 Special Monitoring

Contaminant	MCLG	MCL	Level Detected	Source of Contamination
Sodium (ppm)	n/a	n/a	4.78	Erosion of natural deposits

Collection, sampling result information and table provided by Detroit Water and Sewerage Department (DWSD) Water Quality Division, ML Semegen
 City of Flint sample result information provided by the City of Flint Water Plant, M. Glasgow

2014 Key to the Detected Contaminant Tables

Symbol	Abbreviation for	Definition/Explanation
>	Greater than	
AL	Action Level	The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements which a water system must follow.
HAA5	Haloacetic Acids	HAA5 is the total of bromoacetic, chloroacetic, dibromoacetic, dichloroacetic, and trichloroacetic acids. Compliance is based on the total.
LRAA	Locational Running Annual Average	
MCL	Maximum Contaminant Level	The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MCLG	Maximum Contaminant Level Goal	The level of contaminant in drinking water below which there is no known or expected risk to health.
mg/L	Milligrams per Liter	A milligram = 1/1000 gram 1 milligram per liter is equal to 1ppm
MRDL	Maximum Residual Disinfectant Level	The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MRDLG	Maximum Residual Disinfectant Level Goal	The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.
n/a	Not Applicable	
ND	Not Detected	
NTU	Nephelometric Turbidity Units	Measures the cloudiness of water.
pCi/L	Picocuries per Liter	A measure of radioactivity. Picocurie (pCi) means the quantity of radioactive material producing 2.22 nuclear transformations per minute.
ppb	Parts Per Billion (one in one billion)	The ppb is equivalent to micrograms per liter. A microgram = 1/1000 milligram.
ppm	Parts Per Million (one in one million)	The ppm is equivalent to milligrams per liter. A milligram = 1/1000 gram.
RAA	Running Annual Average	
TT	Treatment Technique	A required process intended to reduce the level of a contaminant in drinking water.
TTHM	Total Trihalomethanes	Total Trihalomethanes is the sum of chloroform, bromodichloromethane, dibromochloromethane and bromoform. Compliance is based on total.



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
**CONSUMER CONFIDENCE REPORT FOR COMMUNITY WATER SUPPLY
CERTIFICATE OF DISTRIBUTION**

Issued under authority of 1976 PA 399 and Administrative Rules, as amended.

Failure to submit certification is a violation of the Act and may subject the water supply to enforcement penalties.

Supply Name: City of Flint	County: Genesee	WSSN: 2310
Population: ☐ 500 or fewer people	☐ 501 – 9,999 people	☒ 10,000 or more people

Community water supplies must confirm that the Consumer Confidence Report (CCR) and any enclosed Public Notices (PN) or notices of CCR availability, have been distributed to customers by July 1 as required under administrative rules R 325.10415 and R 325.10404(4)(c). Supplies must also certify that the information contained in the CCR is correct and consistent with the compliance monitoring data previously submitted to the Michigan Department of Environmental Quality (DEQ). **Return the certification to the appropriate DEQ district office by October 1.** For addresses, visit www.michigan.gov/deq, click on Locations.

Method of delivery to DEQ	
☒ Mail ☐ Email ☐ Hand Delivery ☐ Other	Date delivered: 6/25/2014
Method of delivery to Local Health Department	
☒ Mail ☐ Email ☐ Hand Delivery ☐ Other	Date delivered: 6/25/2014
Method or combination of methods to directly deliver CCR to each bill paying customer. Check <u>all</u> that apply.	
☒ Mail or hand deliver a paper copy of CCR. Date(s) mailed or hand delivered: 6/24/2014	
☐ Mail or hand deliver notification that the CCR is available at a direct URL. Date(s) delivered to customers: _____	
☐ Email notification that CCR is available at direct URL. Date(s) emailed: _____	
☐ Email notification that CCR is attached to the email. Date(s) emailed: _____	
☐ Email notification that CCR is embedded in the email. Date(s) emailed: _____	
If using notification of CCR availability:	
1. Mail a paper CCR to customers who request it and to customers known to be incapable of receiving electronically. 2. Include a copy of the notification to the DEQ district office with this certification form. 3. Explain the nature of the notification, prominently display the direct URL, include statement how to request a paper copy.	
Example of Notification of CCR Availability Subject Line: 2012 Drinking Water Quality Report Available. Message: Your annual report on the source and quality of your drinking water is available on the Web at www.anytown.gov/waterqualityreport. To have a copy mailed to you, contact Anytown at 555-111-1111 or water@anytown.gov.	
☐ Option for supplies serving fewer than 10,000 persons: Publish entire report in newspaper, and notify customers via newspaper(s) in which CCR published, mail, email or hand delivery that individual copies will not be mailed, and include statement how to request a paper copy. Date(s) of publication: _____	
☐ Option for supplies serving 500 or fewer persons: Notify customers via mail, email, hand delivery or, with DEQ approval, posting in public places, that a copy of the report is available from the water supply on request. Date(s) of notification: _____	
Post on Internet (required for supplies serving ≥100,000, optional for others)	
☒ Internet address: www.cityofflint.com/utilities/utilities.asp	Date accessible: 6/26/2014
"Good Faith" efforts to reach non-bill-paying consumers (in addition to the method(s) above). Check <u>all</u> that apply.	
☐ Mail the report to all postal patrons. Zip codes and dates mailed: _____	
☒ Mail to each service connection physical address. Date(s) mailed: 6/24/2014	
☐ Advertise the availability of the report in the newspapers, on TV, and on the radio.	
☐ Publish the report in a local newspaper.	
☐ Post the report in public places such as cafeterias in public buildings, libraries, churches, and schools.	
☐ Deliver multiple copies for distribution by single-bill customers, e.g., apartments or private employers.	
☐ Deliver the report to community organizations.	
☐ Other: _____	
Send to the DEQ a copy of the news articles, a list of channels broadcast and dates, and a list of locations/organizations reports delivered to and dates.	
A Tier 3 Public Notice is Distributed with this CCR	
☐ This CCR is being used to deliver a Tier 3 Public Notice for one or more violations. To use this Tier 3 delivery option, the CCR must be directly delivered to each bill paying customer or, with DEQ approval, continuously posted, and must be issued within 12 months of learning of the violation. A copy of this form must be delivered to the DEQ within 10 days of delivering the CCR to customers to meet the public notification requirements.	
Name/Title: Brent F. Wright / Water Plant Supervisor	
Signature:	 Date: 6/25/2014

See reverse side for U.S. EPA Expectations for Electronic Delivery of CCR

JUN 27 2014

LANSING DISTRICT

02310

CUSTOMER SERVICE CENTER
CITY HALL
1101 S. SAGINAW ST.
FLINT, 48501

DEPT. OF UTILITIES
JUN 27 2014
LANSING DISTRICT



**City of Flint
Water Plant & Facilities**

2013 Consumers Annual Report on Water Quality

The City of Flint Department of Utilities is dedicated to providing high quality drinking water to the residents of the community. The Consumers Annual Report on Water Quality provides important information about your drinking water. This report includes information about the source of the water, health information, a chart summarizing United States Environmental Protection Agency (USEPA) required testing results, and a table giving explanations of important terms to understand when viewing the test results. The Flint Water Plant & Facilities operates and maintains a certified drinking water laboratory to assure compliance with all state and federal regulations and is committed to prompt and thorough notification to the consumers if there is any reason for concern about the quality of the drinking water.

Information about your drinking water is available at the City of Flint web page on the Internet at www.cityofflint.com or by calling the Flint Water Plant & Facilities at (810) 787-6537. The Safe Drinking Water Hotline at (800) 426-4791 is a resource for health related questions and water quality issues. General drinking water information can be found on the USEPA web site at www.epa.gov/safewater/.

Water Source

In 2013, The City of Flint purchased drinking water from the Detroit Water & Sewerage Department (DWSD) which operates several drinking water facilities. Following treatment to remove impurities, the water is pumped by DWSD to the Flint Water Plant, where the water is then monitored and distributed throughout the City.

The source water comes from the lower Lake Huron watershed. The watershed includes numerous short, seasonal streams that drain to Lake Huron. The Michigan Department of Environmental Quality in partnership with the U.S. Geological Survey, the Detroit Water & Sewerage Department, and the Michigan Public Health Institute performed a source water assessment in 2004 to determine the susceptibility of potential contamination. The susceptibility rating is a seven-tiered scale ranging from "very low" to "very high" based primarily on geologic sensitivity, water chemistry, and contaminant sources. The Lake Huron source water intake is categorized as having a moderately low susceptibility to potential contaminant sources. The Lake Huron water treatment plant has historically provided satisfactory treatment of this source water to meet drinking water standards. If you would like to know more information or a complete copy of the report, contact the City of Flint Water Plant at (810) 787-6537.

General Information

In order to ensure that tap water is safe to drink, the EPA prescribes regulations, which limit the amount of certain contaminants in water provided by the public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- ◆ **Microbial contaminants;** such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- ◆ **Inorganic contaminants;** such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- ◆ **Pesticides and herbicides;** which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- ◆ **Organic chemical contaminants;** including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- ◆ **Radioactive contaminants;** which can be naturally occurring or be the result of oil and gas production and mining activities.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

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 Department of Utilities 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 your potential exposure to lead in your water by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. 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 or at <http://www.epa.gov/safewater/lead>.

Lake Huron Water Treatment Plant

2013 Regulated Detected Contaminants Tables

Regulated Contaminant	Test Date	Units	Health Goal MCLG	Allowed Level MCL	Highest Level Detected	Range of Detection	Violation	Major Sources in Drinking Water
Inorganic Chemicals – Monitoring at Plant Finished Water Tap								
Fluoride	05/13/2013	ppm	4	4	0.55	n/a	No	Erosion of natural deposits; Water additive, which promotes strong teeth; Discharge from fertilizer and aluminum factories.
Nitrate	05/13/2013	ppm	10	10	0.32	n/a	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
Barium	6/9/2008	ppm	2	2	0.01	n/a	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits

Disinfection By-Products – Monitoring in Distribution System								
Contaminant	Test Date	Units	Health Goal MCLG	Allowed Level MCL	Highest LRAA	Range of Detection	Violation	Major Sources in Drinking Water
Total Trihalomethanes (TTHM)	2013	ppb	n/a	80	37.8	11.5 – 43.8	No	By-product of drinking water chlorination
Haloacetic Acids (HAA5)	2013	ppb	n/a	60	17.0	6.0 – 19.0	No	By-product of drinking water disinfection

Disinfectant Residuals Monitoring in Distribution System								
Contaminant	Test Date	Units	Health Goal MCLG	Allowed Level MCL	Highest RAA	Range of Detection	Violation	Major Sources in Drinking Water
Disinfectant Total Chlorine Residual	Jan-Dec 2013	ppm	MRDGL 4	MRDL 4	0.81	0.65-0.93	No	Water additive used to control microbes

2013 Turbidity – Monitored every 4 hours at Plant Finished Water Tap			
Highest Single Measurement Cannot exceed 1 NTU	Lowest Monthly % of Samples Meeting Turbidity Limit of 0.3 NTU (minimum 95%)	Violation	Major Sources in Drinking Water
0.26 NTU	100%	No	Soil Runoff
Turbidity is a measure of the cloudiness of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.			

2013 Microbiological Contaminants – Monthly Monitoring in Distribution System					
Regulated Contaminant	MCLG	MCL	Highest Number Detected	Violation	Major Sources in Drinking Water
Total Coliform Bacteria	0	Presence of Coliform bacteria > 5% of monthly samples	in one month 1	No	Naturally present in the environment.
<i>E. coli</i> or Fecal Coliform Bacteria	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal or <i>E. coli</i> positive.	entire year 0	No	Human waste and animal fecal waste.

2011 Lead and Copper Monitoring at Customers' Tap								
Regulated Contaminant	Test Date	Units	Health Goal MCLG	Action Level AL	90 th Percentile Value*	Number of Samples Over AL	Violation	Major Sources in Drinking Water
Lead	2011	ppb	0	15	< 2.0	0	No	Corrosion of household plumbing system; Erosion of natural deposits.
Copper	2011	ppm	1.3	1.3	0.10	0	No	Corrosion of household plumbing system; Erosion of natural deposits; Leaching from wood preservatives.
*The 90th percentile value means 90 percent of the homes tested have lead and copper levels below the given 90th percentile value. If the 90th percentile value is above the AL additional requirements must be met.								

Regulated Contaminant	Treatment Technique		Typical Source of Contaminant
Total Organic Carbon (ppm)	The Total Organic Carbon (TOC) removal ratio is calculated as the ratio between the actual TOC removal and the TOC removal requirements. The TOC was measured each month and because the level was low, there is no requirement for TOC removal.		Erosion of natural deposits

2013 Special Monitoring

Contaminant	MCLG	MCL	Level Detected	Source of Contamination
Sodium (ppm)	n/a	n/a	4.52	Erosion of natural deposits

Collection, sampling result information and table provided by Detroit Water and Sewerage Department (DWSD) Water Quality Division, ML Semegen
Additional sample result information provided by the City of Flint Water Plant Laboratory, M Glasgow

2013 Key to the Detected Contaminant Tables

Symbol	Abbreviation for	Definition/Explanation
>	Greater than	
AL	Action Level	The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements which a water system must follow.
HAA5	Haloacetic Acids	HAA5 is the total of bromoacetic, chloroacetic, dibromoacetic, dichloroacetic, and trichloroacetic acids. Compliance is based on the total.
LRAA	Locational Running Annual Average	
MCL	Maximum Contaminant Level	The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MCLG	Maximum Contaminant Level Goal	The level of contaminant in drinking water below which there is no known or expected risk to health.
MRDL	Maximum Residual Disinfectant Level	The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MRDLG	Maximum Residual Disinfectant Level Goal	The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.
n/a	Not Applicable	
ND	Not Detected	
NTU	Nephelometric Turbidity Units	Measures the cloudiness of water.
ppb	Parts Per Billion (one in one billion)	The ppb is equivalent to micrograms per liter. A microgram = 1/1000 milligram.
ppm	Parts Per Million (one in one million)	The ppm is equivalent to milligrams per liter. A milligram = 1/1000 gram.
RAA	Running Annual Average	
TT	Treatment Technique	A required process intended to reduce the level of a contaminant in drinking water.
TTHM	Total Trihalomethanes	Total Trihalomethanes is the sum of chloroform, bromodichloromethane, dibromochloromethane and bromoform. Compliance is based on total.



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
**CONSUMER CONFIDENCE REPORT FOR COMMUNITY WATER SUPPLY
CERTIFICATE OF DISTRIBUTION**

Issued under authority of 1976 PA 399 and Administrative Rules, as amended.

Failure to submit certification is a violation of the Act and may subject the water supply to enforcement penalties.

ENTERED

Supply Name: City of Flint	County: Genesee	WSSN: 2310
Population: ☐ 500 or fewer people	☐ 501 – 9,999 people	☒ 10,000 or more people

Community water supplies must confirm that the Consumer Confidence Report (CCR) and any enclosed Public Notices (PN) or notices of CCR availability, have been distributed to customers by July 1 as required under administrative rules R 325.10415 and R 325.10404(4)(c). Supplies must also certify that the information contained in the CCR is correct and consistent with the compliance monitoring data previously submitted to the Michigan Department of Environmental Quality (DEQ). Return the certification to the appropriate DEQ district office by October 1. For addresses, visit www.michigan.gov/deq, click on Contact Information in the right column, click on DEQ District Locations and scroll down to the list of DEQ district offices.

Method of delivery to DEQ

☐ Mail ☒ Email ☐ Hand Delivery ☐ Other _____ Date delivered: July 1 2013

Method of delivery to Local Health Department

☐ Mail ☐ Email ☒ Hand Delivery ☐ Other _____ Date delivered: June 28 2013

Method or combination of methods to directly deliver CCR to each bill paying customer. Check all that apply.

- ☒ Mail or hand deliver a paper copy of CCR. Date(s) mailed or hand delivered: Mailed June 25 2013
- ☐ Mail or hand deliver notification that the CCR is available at a direct URL. Date(s) delivered to customers: _____
- ☐ Email notification that CCR is available at direct URL. Date(s) emailed: _____
- ☐ Email notification that CCR is attached to the email. Date(s) emailed: _____
- ☐ Email notification that CCR is embedded in the email. Date(s) emailed: _____

If using notification of CCR availability:

1. Mail a paper CCR to customers who request it and to customers known to be incapable of receiving electronically.
2. Include a copy of the notification to the DEQ district office with this certification form.
3. Explain the nature of the notification, prominently display the direct URL, include statement how to request a paper copy.

Example of Notification of CCR Availability Subject Line: 2012 Drinking Water Quality Report Available.
Message: Your annual report on the source and quality of your drinking water is available on the Web at www.anytown.gov/waterqualityreport. To have a copy mailed to you, contact Anytown at 555-111-1111 or water@anytown.gov.

- ☐ **Option for supplies serving fewer than 10,000 persons:** Publish entire report in newspaper, and notify customers via newspaper(s) in which CCR published, mail, email or hand delivery that individual copies will not be mailed, and include statement how to request a paper copy.
Date(s) of publication: _____
- ☐ **Option for supplies serving 500 or fewer persons:** Notify customers via mail, email, hand delivery or, with DEQ approval, posting in public places, that a copy of the report is available from the water supply on request.
Date(s) of notification: _____

Post on Internet (required for supplies serving ≥100,000, optional for others)

☒ Internet address: www.cityofflint.com/images/2012%20Water%20Quality%20Report.pdf
Date accessible: July 1 2013

"Good Faith" efforts to reach non-bill-paying consumers (in addition to the method(s) above). Check all that apply.

- ☐ Mail the report to all postal patrons. Zip codes and dates mailed: _____
- ☐ Mail to each service connection physical address. Date(s) mailed: _____
- ☐ Advertise the availability of the report in the newspapers, on TV, and on the radio.
- ☐ Publish the report in a local newspaper.
- ☒ Post the report in public places such as cafeterias in public buildings, libraries, churches, and schools.
- ☒ Deliver multiple copies for distribution by single-bill customers, e.g., apartments or private employers.
- ☒ Deliver the report to community organizations.
- ☐ Other: _____

Send to the DEQ a copy of the news articles, a list of channels broadcast and dates, and a list of locations/organizations reports delivered to and dates.

A Tier 3 Public Notice is Distributed with this CCR

- ☐ This CCR is being used to deliver a Tier 3 Public Notice for one or more violations. To use this Tier 3 delivery option, the CCR must be directly delivered to each bill paying customer or, with DEQ approval, continuously posted, and must be issued within 12 months of learning of the violation. A copy of this form must be delivered to the DEQ within 10 days of delivering the CCR to customers to meet the public notification requirements.

Name/Title: Brent Wright Water Plant Supervisor

Signature: Date: July 2 2013



ENTERED

DEQ
RESOURCE MANAGEMENT DIVISION
JUL 01 2011
LANSING DISTRICT



**City of Flint
Water Plant & Facilities**

2012 Consumers Annual Report on Water Quality

The City of Flint Department of Utilities is dedicated to providing high quality drinking water to the residents of the community. The Consumers Annual Report on Water Quality provides important information about your drinking water. This report includes information about the source of the water, health information, a chart summarizing United States Environmental Protection Agency (USEPA) required testing results, and a table giving explanations of important terms to understand when viewing the test results. The Flint Water Plant & Facilities operates and maintains a certified drinking water laboratory to assure compliance with all state and federal regulations and is committed to prompt and thorough notification to the consumers if there is any reason for concern about the quality of the drinking water.

Information about your drinking water is available at the City of Flint web page on the Internet at www.cityofflint.com or by calling the Flint Water Plant & Facilities at (810) 787-6537. The Safe Drinking Water Hotline at (800) 426-4791 is a resource for health related questions and water quality issues. General drinking water information can be found on the USEPA web site at www.epa.gov/safewater/.

Water Source

The City of Flint purchases drinking water from the Detroit Water & Sewerage Department (DWSD) which operates several drinking water facilities. Following treatment to remove impurities, the water is pumped by DWSD to the Flint Water Plant, where the water is then monitored and distributed throughout the City.

The source water comes from the lower Lake Huron watershed. The watershed includes numerous short, seasonal streams that drain to Lake Huron. The Michigan Department of Environmental Quality in partnership with the U.S. Geological Survey, the Detroit Water & Sewerage Department, and the Michigan Public Health Institute performed a source water assessment in 2004 to determine the susceptibility of potential contamination. The susceptibility rating is a seven-tiered scale ranging from "very low" to "very high" based primarily on geologic sensitivity, water chemistry, and contaminant sources. The Lake Huron source water intake is categorized as having a moderately low susceptibility to potential contaminant sources. The Lake Huron water treatment plant has historically provided satisfactory treatment of this source water to meet drinking water standards. If you would like to know more information or a complete copy of the report, contact the City of Flint Water Plant at (810) 787-6537.

General Information

In order to ensure that tap water is safe to drink, the EPA prescribes regulations, which limit the amount of certain contaminants in water provided by the public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- ♦ **Microbial contaminants;** such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- ♦ **Inorganic contaminants;** such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- ♦ **Pesticides and herbicides;** which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- ♦ **Organic chemical contaminants;** including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- ♦ **Radioactive contaminants;** which can be naturally occurring or be the result of oil and gas production and mining activities.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

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 Department of Utilities 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 your potential exposure to lead in your water by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. 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 or at <http://www.epa.gov/safewater/lead>.

Lake Huron Water Treatment Plant 2012 Regulated Detected Contaminants

Regulated Contaminant	Test Date	Units	Health Goal MCLG	Allowed Level MCL	Highest Level Detected	Range of Detection	Violation yes/no	Major Sources in Drinking Water
Inorganic Chemicals – Monitoring at Plant Finished Water Tap								
Fluoride	8/14/2012	ppm	4	4	0.71	n/a	No	Erosion of natural deposits; Water additive, which promotes strong teeth; Discharge from fertilizer and aluminum factories.
Nitrate	8/14/2012	ppm	10	10	0.32	n/a	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
Barium	6/9/2008	ppm	2	2	0.01	n/a	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Disinfection By-Products – Stage 1, 1st Quarter Monitoring in Distribution System								
Total Trihalomethanes (TTHM)	Mar 2012	ppb	n/a	80	15.0	12.0-15.0	No	By-product of drinking water chlorination
Haloacetic Acids (HAA5)	Mar 2012	ppb	n/a	60	10.0	7.0-10.0	No	By-product of drinking water disinfection
Disinfection By-Products – Stage 2, 2nd - 4th Quarter Monitoring in Distribution System								
Total Trihalomethanes (TTHM)	May-Nov 2012	ppb	n/a	80	57.8	15.2-57.8	No	By-product of drinking water chlorination
Haloacetic Acids (HAA5)	May-Nov 2012	ppb	n/a	60	19.0	8.0-19.0	No	By-product of drinking water disinfection
Disinfectant Residuals Monitoring in Distribution System								
Disinfectant (Total Chlorine residual)	Jan-Dec 2012	ppm	MRDGL 4	MRDL 4	1.40	0.10-1.40	No	Water additive used to control microbes

2012 Turbidity – Monitored every 4 hours at Plant Finished Water Tap			
Highest Single Measurement Cannot exceed 1 NTU	Lowest Monthly % of Samples Meeting Turbidity Limit of 0.3 NTU (minimum 95%)	Violation yes/no	Major Sources in Drinking Water
0.13 NTU	100%	No	Soil Runoff
Turbidity is a measure of the cloudiness of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.			

2012 Microbiological Contaminants – Monthly Monitoring in Distribution System					
Regulated Contaminant	MCLG	MCL	Highest Number Detected	Violation yes/no	Major Sources in Drinking Water
Total Coliform Bacteria	0	Presence of Coliform bacteria > 5% of monthly samples	in one month 4	No	Naturally present in the environment.
<i>E. coli</i> or Fecal Coliform Bacteria	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal or <i>E. coli</i> positive.	entire year 0	No	Human waste and animal fecal waste.

2011 Lead and Copper Monitoring at Customers' Tap								
Regulated Contaminant	Test Date	Units	Health Goal MCLG	Action Level AL	90 th Percentile Value*	Number of Samples Over AL	Violation yes/no	Major Sources in Drinking Water
Lead	2011	ppb	0	15	< 2.0	0	No	Corrosion of household plumbing system; Erosion of natural deposits.
Copper	2011	ppm	1.3	1.3	0.102	0	No	Corrosion of household plumbing system; Erosion of natural deposits; Leaching from wood preservatives.
*The 90th percentile value means 90 percent of the homes tested have lead and copper levels below the given 90th percentile value. If the 90th percentile value is above the AL additional requirements must be met.								

Regulated Contaminant	Treatment Technique	Running annual average	Monthly Ratio Range	Violation Yes/No	Typical Source of Contaminant
Total Organic Carbon (ppm)	The Total Organic Carbon (TOC) removal ratio is calculated as the ratio between the actual TOC removal and the TOC removal requirements. The TOC was measured each month and because the level was low, there is no requirement for TOC removal.				Erosion of natural deposits

2012 Special Monitoring

Contaminant	MCLG	MCL	Level Detected	Source of Contamination
Sodium (ppm)	n/a	n/a	4.74	Erosion of natural deposits

Key to Detected Contaminants Table

Symbol	Abbreviation for	Definition/Explanation
MCLG	Maximum Contaminant Level Goal	The level of contaminant in drinking water below which there is no known or expected risk to health.
MCL	Maximum Contaminant Level	The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MRDLG	Maximum Residual Disinfectant Level Goal	The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.
MRDL	Maximum Residual Disinfectant Level	The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
ppb	Parts per billion (one in one billion)	The ppb is equivalent to micrograms per liter. A microgram = 1/1000 milligram.
ppm	Parts per million (one in one million)	The ppm is equivalent to milligrams per liter. A milligram = 1/1000 gram.
NTU	Nephelometric Turbidity Units	Measures the cloudiness of water.
ND	Not Detected	
TT	Treatment Technique	A required process intended to reduce the level of a contaminant in drinking water.
AL	Action Level	The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements which a water system must follow.
HAA5	Haloacetic acids	HAA5 is the total of bromoacetic, chloroacetic, dibromoacetic, dichloroacetic, and trichloroacetic acids. Compliance is based on the total.
TTHM	Total Trihalomethanes	Total Trihalomethanes is the sum of chloroform, bromodichloromethane, dibromochloromethane and bromoform. Compliance is based on total.
pCi/l	picocuries per liter	a measure of radioactivity
n/a	not applicable	
<	Less than	
>	Greater than	



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
RESOURCE MANAGEMENT DIVISION

**CONSUMER CONFIDENCE REPORT FOR COMMUNITY WATER SUPPLY
CERTIFICATE OF DISTRIBUTION**

Issued under authority of 1976 PA 399 and Administrative Rules, as amended.

Failure to submit certification is a violation of the Act and may subject the water supply to enforcement penalties.

Supply Name: City of Flint	County: Genesee	WSSN: 2310
Population: ☐ 500 or fewer people	☐ 501 - 9999 people	☒ 10,000 or more people

Community water supplies must confirm that the Consumer Confidence Report (CCR) and any enclosed Public Notices (PN) or notices of CCR availability, have been distributed to customers by July 1 as required under administrative rules R 325.10415 and R 325.10404(4)(c). Supplies must also certify that the information contained in the CCR is correct and consistent with the compliance monitoring data previously submitted to the Michigan Department of Environmental Quality (DEQ). **Return the certification to the appropriate DEQ district office by October 1.** For addresses, visit www.michigan.gov/deq, click on Contact Information in the right column, click on DEQ District Locations and scroll down to the list of DEQ district offices.

Method of delivery to DEQ

☒ Mail ☐ Hand Delivery ☐ Other _____ Date delivered: 6/28/2012

Method of delivery to Local Health Department

☐ Mail ☒ Hand Delivery ☐ Other _____ Date delivered: 6/29/2012

Primary method of delivery to customers (select one)

- ☒ Direct mailing to all customers. Date(s) mailed: 7/14/2012
- ☐ Hand delivery to all customers. Date(s) delivered: _____
- ☐ Publish entire report in newspaper, and notify customers via newspaper or mail that individual copies will not be mailed, and notify customers how to obtain copies of the report.
This option is available only to supplies serving fewer than 10,000 persons.
Date(s) of publication: _____
- ☐ Notify customers via newspaper, mail, hand delivery or, with DEQ approval, posting in public places, that a copy of the report is available from the water supply upon request.
This option is available only to supplies serving fewer than 501 persons.
Date(s) of notification: _____

Post on Internet (required for supplies serving $\geq 100,000$, optional for others)

☒ Internet address: www.cityofflint.com Date accessible: 6/13/2012

"Good Faith" efforts to reach non-bill-paying consumers (in addition to the methods indicated above - select all that apply)

- ☐ Mail the report to all postal patrons.
Zip codes and dates mailed: _____
- ☐ Advertise the availability of the report in the newspapers, on TV, and on the radio.
- ☐ Publish the report in a local newspaper.
- ☒ Post the report in public places such as cafeterias in public buildings, libraries, churches, and schools.
- ☒ Deliver multiple copies for distribution by single-bill customers, e.g., apartments or private employers.
- ☒ Deliver the report to community organizations.
- ☐ Other: _____

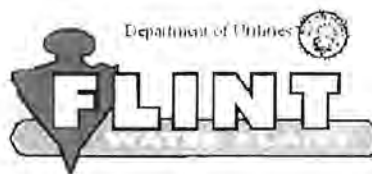
Send to the DEQ a copy of the news articles, a list of channels broadcast and dates, and a list of locations/organizations reports delivered to and dates.

Use of CCR to satisfy Tier 3 Public Notice requirements

- ☐ This CCR is being used to satisfy Tier 3 Public Notice requirements for one or more violations. The CCR must be delivered by direct mail, hand delivery or, with DEQ approval, continuous posting, and must be issued within 12 months of learning of the violation. A copy of this form must be delivered to the DEQ within 10 days of delivering the CCR to customers to meet the public notification requirements.

Name/Title: Brent F. Wright Plant Supervisor

Signature: Date: 8/30/2012



**City of Flint
Water Plant & Facilities**

2011 Consumers Annual Report on Water Quality

The City of Flint Department of Utilities is dedicated to providing a high quality drinking water to the residents of the community. The Consumers Annual Report on Water Quality provides important information about your drinking water. This report includes information about the source of the water, health information, a chart summarizing United States Environmental Protection Agency (USEPA) required testing results, and a table giving explanations of important terms to understand when viewing the test results. The Flint Water Plant & Facilities maintains total compliance with all state and federal regulations and is committed to prompt and thorough notification to the consumers if there is any reason for concern about the quality of the drinking water.

Information about your drinking water is available at the City of Flint web page on the Internet at www.cityofflint.com or by calling the Flint Water Plant & Facilities at (810) 787-6537. The Safe Drinking Water Hotline at (800) 426-4791 is a resource for health related questions and water quality issues. General drinking water information can be found on the USEPA web site at www.epa.gov/safewater/.

Water Source

The City of Flint purchases drinking water from the Detroit Water & Sewerage Department (DWSD) which operates several drinking water facilities. Following treatment to remove impurities, the water is pumped by DWSD to the Flint Water Plant, where the water is then monitored and distributed throughout the City.

The source water comes from the lower Lake Huron watershed. The watershed includes numerous short, seasonal streams that drain to Lake Huron. The Michigan Department of Environmental Quality in partnership with the U.S. Geological Survey, the Detroit Water & Sewerage Department, and the Michigan Public Health Institute performed a source water assessment in 2004 to determine the susceptibility of potential contamination. The susceptibility rating is a seven-tiered scale ranging from "very low" to "very high" based primarily on geologic sensitivity, water chemistry, and contaminant sources. The Lake Huron source water intake is categorized as having a moderately low susceptibility to potential contaminant sources. The Lake Huron water treatment plant has historically provided satisfactory treatment of this source water to meet drinking water standards. If you would like to know more information or a complete copy of the report, contact the City of Flint Water Plant at (810) 787-6537.

General Information

To ensure that tap water is safe to drink, the EPA prescribes regulations, which limit the amount of certain contaminants in water provided by the public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- ◆ **Microbial contaminants;** such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- ◆ **Inorganic contaminants;** such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- ◆ **Pesticides and herbicides;** which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- ◆ **Organic chemical contaminants;** including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- ◆ **Radioactive contaminants;** which can be naturally occurring or be the result of oil and gas production and mining activities.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

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 Department of Utilities 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 your potential exposure to lead in your water by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. 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 or at <http://www.epa.gov/safewater/lead>.

Lake Huron Water Treatment Plant 2011 Regulated Detected Contaminants Tables

Contaminant	Test Date	Units	Health Goal MCLG	Allowed Level MCL	Highest Level Detected	Range of Detection	Violation yes/no	Major Sources in Drinking Water
Inorganic Chemicals – Annual Monitoring at Plant Finished Water Tap								
Fluoride	08/14/2011	ppm	4	4	0.98	n/a	No	Erosion of natural deposits; Water additive, which promotes strong teeth; Discharge from fertilizer and aluminum factories.
Nitrate	08/14/2011	ppm	10	10	0.30	n/a	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Barium	6/9/2008	ppm	2	2	0.01	n/a	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
Disinfectant Residuals and Disinfection By-Products – Monitoring in Distribution System								
Total Trihalomethanes (TTHM)	Feb-Nov 2011	ppb	n/a	80	36.0	11.0 - 36.0	No	By-product of drinking water chlorination
Haloacetic Acids (HAA5)	Feb- Nov 2011	ppb	n/a	60	14.0	6.0 - 14.0	No	By-product of drinking water disinfection
Disinfectant (Total Chlorine Residual)	Jan-Dec 2011	ppm	MRDGL 4	MRDL 4	1.10	0.30 – 1.10	No	Water additive used to control microbes

2011 Turbidity – Monitored every 4 hours at Plant Finished Water Tap			
Highest Single Measurement Cannot exceed 1 NTU	Lowest Monthly % of Samples Meeting Turbidity Limit of 0.3 NTU (minimum 95%)	Violation yes/no	Major Sources in Drinking Water
0.2 NTU	100%	No	Soil Runoff
Turbidity is a measure of the cloudiness of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.			

2011 Microbiological Contaminants – Monthly Monitoring in Distribution System					
Contaminant	MCLG	MCL	Highest Number Detected	Violation yes/no	Major Sources in Drinking Water
Total Coliform Bacteria	0	Presence of Coliform bacteria > 5% of monthly samples	0	No	Naturally present in the environment.
<i>E. coli</i> or fecal coliform bacteria	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal or <i>E. coli</i> positive.	0	No	Human waste and animal fecal waste.

2011 Lead and Copper Monitoring at Customers' Tap								
Contaminant	Test Date	Units	Health Goal MCLG	Action Level AL	90 th Percentile Value*	Number of Samples Over AL	Violation yes/no	Major Sources in Drinking Water
Lead	2011	ppb	0	15	< 2.0	0	No	Corrosion of household plumbing system; Erosion of natural deposits.
Copper	2011	ppm	1.3	1.3	0.102	0	No	Corrosion of household plumbing system; Erosion of natural deposits; Leaching from wood preservatives.
*The 90th percentile value means 90 percent of the homes tested have lead and copper levels below the given 90th percentile value. If the 90th percentile value is above the AL additional requirements must be met.								

Regulated Contaminant	Treatment Technique	Running annual average	Monthly Ratio Range	Violation Yes/No	Typical Source of Contaminant
Total Organic Carbon (ppm)	The Total Organic Carbon (TOC) removal ratio is calculated as the ratio between the actual TOC removal and the TOC removal requirements. The TOC was measured each month and because the level was low, there is no requirement for TOC removal.				Erosion of natural deposits

2011 Special Monitoring

Contaminant	MCLG	MCL	Level Detected	Source of Contamination
Sodium (ppm)	n/a	n/a	4.76	Erosion of natural deposits

Distribution sampling result information and table provided by Detroit Water and Sewerage Department (DWSD) Water Quality Division, ML Sampling.

Distribution system sampling & result information (including lead & copper) provided by the City of Flint Water Plant, M.Glasgow.

Key to Detected Contaminants Table		
Symbol	Abbreviation for	Definition/Explanation
MCLG	Maximum Contaminant Level Goal	The level of contaminant in drinking water below which there is no known or expected risk to health.
MCL	Maximum Contaminant Level	The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MRDLG	Maximum Residual Disinfectant level goal	The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.
MRDL	Maximum Residual Disinfectant Level	The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
ppb	Parts per billion (one in one billion)	The ppb is equivalent to micrograms per liter. A microgram = 1/1000 milligram.
ppm	Parts per million (one in one million)	The ppm is equivalent to milligrams per liter. A milligram = 1/1000 gram.
NTU	Nephelometric Turbidity Units	Measures the cloudiness of water.
ND	Not Detected	
TT	Treatment Technique	A required process intended to reduce the level of a contaminant in drinking water.
AL	Action Level	The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements which a water system must follow.
HAA5	Haloacetic acids	HAA5 is the total of bromoacetic, chloroacetic, dibromoacetic, dichloroacetic, and trichloroacetic acids. Compliance is based on the total of all five.
TTHM	Total Trihalomethanes	Total Trihalomethanes is the sum of chloroform, bromodichloromethane, dibromochloromethane and bromoform. Compliance is based on the total of all five.
pCi/l	picocuries per liter	A measure of radioactivity.
n/a	not applicable	
>	Greater than	



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
RESOURCE MANAGEMENT DIVISION

**CONSUMER CONFIDENCE REPORT FOR COMMUNITY WATER SUPPLY
CERTIFICATE OF DISTRIBUTION**

Issued under authority of 1976 PA 399 and Administrative Rules, as amended.

Failure to submit certification is a violation of the Act and may subject the water supply to enforcement penalties.

Supply Name: City of Flint	County: Genesee	WSSN: 2310
Population: ☐ 500 or fewer people	☐ 501 - 9999 people	☒ 10,000 or more people

Administrative Rule R 325.10415 and R 325.10404(4)(c) requires the community water supply to confirm that the *Consumer Confidence Report* (CCR) and any Public Notices (PN) enclosed with it have been distributed to customers (and appropriate notices of availability have been given) according to the CCR requirements and PN requirements, if applicable. Delivery is due by July 1 following the year covered by the CCR. Further, the supply shall certify that the information contained in the CCR is correct and consistent with the compliance monitoring data previously submitted to the Michigan Department of Environmental Quality (DEQ). Return certification to the appropriate DEQ district office by October 1 following the year covered by the report. For district office addresses, visit www.michigan.gov/deq and click on Contacts.

Method of delivery to DEQ

☒ Mail ☐ Hand Delivery ☐ Other _____ Date delivered: 6/29/11

Method of delivery to Local Health Department

☐ Mail ☒ Hand Delivery ☐ Other _____ Date delivered: 6/30/11

Primary method of delivery to customers (select one)

- ☒ Direct mailing to all customers. Date(s) mailed: 6/29/11
- ☐ Hand delivery to all customers. Date(s) delivered: _____
- ☐ Publish entire report in newspaper, and notify customers via newspaper or mail that individual copies will not be mailed, and notify customers how to obtain copies of the report.
This option is available only to supplies serving fewer than 10,000 persons.
Date(s) of publication: _____
- ☐ Notify customers via newspaper, mail, hand delivery or, with DEQ approval, posting in public places, that a copy of the report is available from the water supply upon request.
This option is available only to supplies serving fewer than 501 persons.
Date(s) of notification: _____

Post on Internet (required for supplies serving $\geq 100,000$, optional for others)

☒ Internet address: www.cityofflint.com Date accessible: 7/5/11

"Good Faith" efforts to reach non-bill-paying consumers (in addition to the method(s) indicated above - select all that apply)

- ☐ Mail the report to all postal patrons.
Zip codes and dates mailed: _____
- ☐ Advertise the availability of the report in the newspapers, on TV, and on the radio.
- ☐ Publish the report in a local newspaper.
- ☒ Post the report in public places such as cafeterias in public buildings, libraries, churches, and schools.
- ☒ Deliver multiple copies for distribution by single-bill customers, e.g., apartments or private employers.
- ☐ Deliver the report to community organizations.
- ☐ Other: _____

Send to the DEQ a copy of the news articles, a list of channels broadcast and dates, and a list of locations/organizations reports delivered to and dates.

Use of CCR to satisfy Tier 3 Public Notice requirements

- ☐ This CCR is being used to satisfy Tier 3 Public Notice requirements for one or more violations. The CCR must be delivered by direct mail, hand delivery or, with DEQ approval, continuous posting, and must be issued within 12 months of learning of the violation. A copy of this form must be delivered to the DEQ within 10 days of delivering the CCR to customers to meet the public notification requirements.

Name/Title: Brent F. Wright Water Plant Supervisor	DEQ RESOURCE MANAGEMENT DIVISION
Signature:	Date: 9/14/11 810-787-6537

SEP 19 2011
LANSING DISTRICT



**City of Flint
Water Plant & Facilities**

2010 Consumers Annual Report on Water Quality

The City of Flint Department of Utilities is dedicated to providing a high quality drinking water to the residents of the community. The Consumers Annual Report on Water Quality provides important information about your drinking water. This report includes information about the source of the water, contaminant & health related information, a chart summarizing United States Environmental Protection Agency (USEPA) required testing results, and a table giving explanations of important terms to understand when viewing the test results. The Flint Water Plant & Facilities maintains total compliance with all state and federal regulations and is committed to prompt and thorough notification to the consumers if there is any reason for concern about the quality of the drinking water.

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Water Source

The City of Flint purchases drinking water from the Detroit Water & Sewerage Department (DWSD) which operates several drinking water facilities. Following treatment to remove impurities, the water is pumped by DWSD to the Flint Water Plant, where the water is then monitored and distributed throughout the City.

The source water comes from the lower Lake Huron watershed. The watershed includes numerous short, seasonal streams that drain to Lake Huron. The Michigan Department of Environmental Quality in partnership with the U.S. Geological Survey, the Detroit Water & Sewerage Department, and the Michigan Public Health Institute performed a source water assessment in 2004 to determine the susceptibility of potential contamination. The susceptibility rating is a seven-tiered scale ranging from "very low" to "very high" based primarily on geologic sensitivity, water chemistry, and contaminant sources. The Lake Huron source water intake is categorized as having a moderately low susceptibility to potential contaminant sources. The Lake Huron water treatment plant has historically provided satisfactory treatment of this source water to meet drinking water standards. If you would like to more information about this report or a complete copy of the report, contact the City of Flint Water Plant at (810) 787-6537.

Health Information

To ensure that tap water is safe to drink, the EPA prescribes regulations, which limit the amount of certain contaminants in water provided by the public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- ◆ **Microbial contaminants;** such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- ◆ **Inorganic contaminants;** such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- ◆ **Pesticides and herbicides;** which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- ◆ **Organic chemical contaminants;** including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- ◆ **Radioactive contaminants;** which can be naturally occurring or be the result of oil and gas production and mining activities.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

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 Department of Utilities 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 your potential exposure to lead in your water by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. 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 or at <http://www.epa.gov/safewater/lead>.

The City of Flint Water Plant conducts lead & copper monitoring every three years from a limited number of consumer taps. The next monitoring will take place from July 1st through September 1st of 2011. If you are interested in using your residence as a sample location in this round of monitoring, please contact the City of Flint Water Plant laboratory at (810) 787-6537 to determine if your residence qualifies, and sample locations are still needed.

Lake Huron Water Treatment Plant 2010 Regulated Detected Contaminants Tables

Contaminant	Test Date	Units	Health Goal MCLG	Allowed Level MCL	Highest Level Detected	Range of Detection	Violation yes/no	Major Sources in Drinking Water
Inorganic Chemicals – Annual Monitoring at Plant Finished Water Tap								
Fluoride	Jan-Dec 2010	ppm	4	4	1.40	0.56-1.40	No	Erosion of natural deposits; Water additive, which promotes strong teeth; Discharge from fertilizer and aluminum factories.
Nitrate	8/23/2010	ppm	10	10	0.32	n/a	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Barium	6/9/2008	ppm	2	2	0.01	n/a	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
Disinfectant Residuals and Disinfection By-Products – Monitoring in Distribution System								
Total Trihalomethanes (TTHM)	Feb-Nov 2010	ppb	n/a	80	25.0	12.0-25.0	No	By-product of drinking water chlorination
Halooacetic Acids (HAA5)	Feb- Nov 2010	ppb	n/a	60	18.0	7.0-18.0	No	By-product of drinking water disinfection
Disinfectant (Total Chlorine residual)	Jan-Dec 2010	ppm	MRDGL 4	MRDL 4	1.2	0.1-1.2	No	Water additive used to control microbes

2010 Turbidity – Monitored every 4 hours at Plant Finished Water Tap			
Highest Single Measurement Cannot exceed 1 NTU	Lowest Monthly % of Samples Meeting Turbidity Limit of 0.3 NTU (minimum 95%)	Violation yes/no	Major Sources in Drinking Water
0.09 NTU	100%	No	Soil Runoff
Turbidity is a measure of the cloudiness of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.			

2010 Microbiological Contaminants – Monthly Monitoring in Distribution System					
Contaminant	MCLG	MCL	Highest Number Detected	Violation yes/no	Major Sources in Drinking Water
Total Coliform Bacteria	0	Presence of Coliform bacteria > 5% of monthly samples	in one month 1%	No	Naturally present in the environment.
<i>E. coli</i> or fecal coliform bacteria	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal or <i>E. coli</i> positive.	entire year 0	No	Human waste and animal fecal waste.

2008 Lead and Copper Monitoring at Customers' Tap								
Contaminant	Test Date	Units	Health Goal MCLG	Action Level AL	90 th Percentile Value*	Number of Samples Over AL	Violation yes/no	Major Sources in Drinking Water
Lead	2008	ppb	0	15	0.0	0	No	Corrosion of household plumbing system; Erosion of natural deposits.
Copper	2008	ppm	1.3	1.3	0.027	0	No	Corrosion of household plumbing system; Erosion of natural deposits; Leaching from wood preservatives.
*The 90th percentile value means 90 percent of the homes tested have lead and copper levels below the given 90th percentile value. If the 90th percentile value is above the AL additional requirements must be met.								

Regulated Contaminant	Treatment Technique	Running Annual Average	Monthly Ratio Range	Violation Yes/No	Typical Source of Contaminant
Total Organic Carbon (ppm)	The Total Organic Carbon (TOC) removal ratio is calculated as the ratio between the actual TOC removal and the TOC removal requirements. The TOC was measured each month and because the level was low, there is no requirement for TOC removal.				Erosion of natural deposits

2010 Special Monitoring

Contaminant	MCLG	MCL	Level Detected	Source of Contamination
Sodium (ppm)	n/a	n/a	4.45	Erosion of natural deposits

Collection, sampling result information and table provided by Detroit Water and Sewerage Department (DWSJ) Water Quality Division, ML Semegen.

Distribution & consumers tap sampling result information provided by the City of Flint Water Plant, M Glasgow.

Key to Detected Contaminants Table

Symbol	Abbreviation for	Definition/Explanation
MCLG	Maximum Contaminant Level Goal	The level of contaminant in drinking water below which there is no known or expected risk to health.
MCL	Maximum Contaminant Level	The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MRDLG	Maximum Residual Disinfectant level goal	The level of a drinking water disinfectant below which there is no known or expected risk to health. MRLDG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.
MRDL	Maximum Residual Disinfectant Level	The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
ppb	Parts per billion (one in one billion)	The ppb is equivalent to micrograms per liter. A microgram = 1/1000 milligram.
ppm	Parts per million (one in one million)	The ppm is equivalent to milligrams per liter. A milligram = 1/1000 gram.
NTU	Nephelometric Turbidity Units	Measures the cloudiness of water.
ND	Not Detected	
TT	Treatment Technique	A required process intended to reduce the level of a contaminant in drinking water.
AL	Action Level	The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements which a water system must follow.
HAA5	Haloacetic acids	HAA5 is the total of bromoacetic, chloroacetic, dibromoacetic, dichloroacetic, and trichloroacetic acids. Compliance is based on the total of all five.
TTHM	Total Trihalomethanes	Total Trihalomethanes is the sum of chloroform, bromodichloromethane, dibromochloromethane and bromoform. Compliance is based on the total of all five.
pCi/l	picocuries per liter	A measure of radioactivity.
n/a	not applicable	
>	Greater than	



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

November 9, 2015

Mr. Michael Glasgow
Utilities Administrator
City of Flint
4500 North Dort Highway
Flint, Michigan 48505

WSSN: #2310

Dear Mr. Glasgow:

SUBJECT: Water Supply – City of Flint (City) – Compliance Communication
Lead and Copper Rule Compliance Sampling Sites

The City community water system is subject to the requirements of the Michigan Safe Drinking Water Act, 1976 Public Act 399, as amended (Act 399). According to Department of Environmental Quality (DEQ) records, City reports submitted to the DEQ regarding Lead and Copper Rule (LCR) compliance monitoring information have been certified by the City that all LCR compliance monitoring since 1992 has been conducted at sampling sites meeting the Tier 1 criteria listed under subrule 1c of administrative rule 710a (R325.10710a).

The City's recent efforts to electronically convert customer service line information and statements by some of the City's certified operators conflict with the information provided in the City's LCR compliance monitoring certification reports.

Therefore, the DEQ is hereby requesting the City provide additional information and documentation regarding all 324 historic LCR compliance sampling sites.

As of November 3, 2015, the City's electronic database of customer service connections listed 10,895 records of converted customer service connection index cards. The City has recently indicated it has a total of 29,072 customer service connections, leaving approximately 18,177 records left to be converted. These digital records include a listing of the service line material.

The DEQ has obtained a copy of these 10,895 digital records and cross referenced them with the addresses for the City's 324 historic LCR compliance monitoring sites. However, only 46 of the 324 sites were able to be matched at the current time. Of these 46 sites, only 6 sites contained information confirming the Tier 1 site criteria based on having lead service line materials. 14 sites were listed as having no available information (n/a), and require additional documentation to justify being designated as a Tier 1 sample site having a lead service line. The remaining 26 cross referenced sites were listed as having copper service line materials which directly conflicts with the City's LCR reports certifying these sites as Tier 1 based on the criteria of having a lead service line. The City needs to provide additional information to the DEQ demonstrating these sites meet the Tier 1 site criteria or we will assume they do not.

The City's remaining 278 historic LCR compliance sampling sites must also be reviewed and will require additional documentation to justify being designated as Tier 1 sample sites.

Mr. Michael Glasgow

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November 9, 2015

Our office has provided the enclosed table that lists all 324 of the City's historic LCR compliance monitoring sites, when each site was utilized, the City's certification information for each site, and information cross referenced from the City's customer service line database. The City can use the far right column in this table, labeled *Justification of Lead Service Line and Tier 1 Criteria*, to summarize the City's justification for certifying these sites as Tier 1 and having a lead service line. Any supporting documentation regarding the justification for each site needs to be provided as separate attachments.

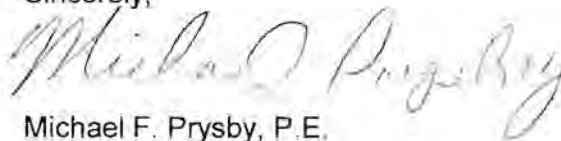
As a reminder, in accordance with subrule 1 of administrative rule 710a (R325.10710a), by January 1, 1992, the City was to have completed a materials evaluation of its distribution system to identify a pool of targeted sampling sites from which all first draw samples are collected. This evaluation was required to include information from:

- Special Monitoring for Corrosivity Characteristics
- All plumbing codes, permits, and records in the files of the building department or departments that indicate the plumbing materials installed within publically and privately owned structures connected to the water distribution system.
- All inspections and records of the distribution system indicating material composition of customer service connections.
- Water quality information that indicates locations which may be particularly susceptible to high lead or copper concentrations.

The completed table and all supporting documentation must be provided to our office as soon as possible, but by no later than December 30, 2015, prior to the next LCR compliance monitoring period.

Please contact me at 517-290-8817 or prysbym@michigan.gov at your earliest convenience to discuss this matter in more detail.

Sincerely,



Michael F. Prysby, P.E.
District Engineer
Lansing District Office
Office of Drinking Water and
Municipal Assistance

cc: Mr. Robert Bisnick, City of Flint
Mr. Brent Wright, City of Flint
Mr. Howard Kroft, City of Flint
Ms. Natasha Henderson, City of Flint
Mr. Jim Sygo, Chief Deputy Director, DEQ
Mr. Stephen Busch, DEQ
Mr. Adam Rosenthal, DEQ

City of Flint
X-Connection
Annual Pumpage
CCRs



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

October 22, 2015

Mr. Brent Wright
City Of Flint – D.P.W
Flint Water Plant
4500 North Dort Highway
Flint, Michigan 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Revised Drinking Water Monitoring Schedule – 2015
Monthly Operation Reports
Siting Plans and Record Keeping

Monitoring Schedule:

Enclosed is your revised Drinking Water Monitoring Schedule for remainder of calendar year 2015 outlining the minimum requirements for your public water supply. Your schedule has been revised based on the City's change in source of its drinking water from the treatment of the Flint River utilizing the City's Water Treatment Plant to the Great Lakes Water Authority/Detroit Water and Sewerage Department. Collect samples early in the monitoring period of the year indicated on the schedule. If you use a private laboratory you are required to report the results to us within the first ten days of the month following the month that you received the results. To receive credit for monitoring, the "**WSSN**" (water supply serial number), the "**Site Code,**" and "**County**" must appear on the sample result. Bottles will NOT be mailed automatically. If you use the Department of Environmental Quality Laboratory, you can order bottles by calling 517-335-8184. Be certain of the United States Environmental Protection Agency sampling and analysis method requirements for hold times.

Monthly Operation Report (MOR) Requirements:

The City shall submit MORs as required under Administrative Rule 1502 (R325.11502). Please note required coliform bacteria monitoring results and associated chlorine residual monitoring shall be submitted to the department within the first 10 days following the end of the required monthly monitoring period. In addition, monthly operation reports shall be submitted to the department during the month following the month for which the monthly operation report was prepared.

Disinfection By-Product Sample Siting Plans:

The City of Flint shall continue routine standard monitoring of disinfection by-products, according to your Disinfection & Disinfectants By-Product (DDBP) plan which identifies 8 sites for routine quarterly monitoring.

Lead and Copper Monitoring Requirements and Site Sample Pool

Please note distribution system monitoring for water quality parameters (WQPs) continues at the expanded set of 25 sites per quarter. Lead and copper monitoring in accordance with the requirements of Administrative Rule 710a (R325.10710a) is being required for the 6 month period between January 1, 2016 and June 30, 2016. The City must ensure its sample site pool is large enough to collect the number of lead and copper tap samples required. All sites from which first draw samples are collected shall be selected from the pool of targeted sampling sites.

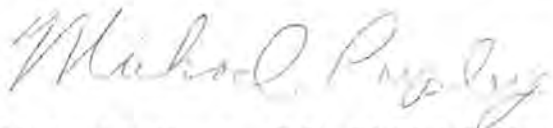
The City shall also conduct additional operational monitoring to demonstrate the effectiveness of corrosion control treatment.

Record Keeping:

The City shall maintain all monitoring records in accordance with all applicable requirements under the Administrative Rules including Rule 720a (R325.10720a), Rule 1506 (R325.11506), and Rule 1507 (R325.11507).

The Michigan Safe Drinking Water Act requires certain reports to be submitted to this office each year. Please remember that cross connection reports and annual pumpage reports are due by March 31, and the **Consumer Confidence Report** is due by July 1.

Also enclosed is the document "2015 Monitoring and Reporting Requirements." This provides additional details about monitoring and reporting requirements. If you have any questions, please contact us using the information below.



Michael F. Prysby, P.E., District Engineer
Lansing District Office
Office of Drinking Water and
Municipal Assistance
517-290-8817



Adam Rosenthal, EQA
Lansing District Office
Office of Drinking Water and
Municipal Assistance
517-284-6644

Enclosure

cc/encl: Mr. Robert Bisnick, City Of Flint
Genesee County Health Department



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



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

March 30, 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 July 1, 2014, through December 31, 2014.

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)	6.0 ppb	2	100	1/1 and 6/30/2015 Submit results to this office by July 10, 2015
Copper 1.3 parts per million (ppm)	0.11 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 2014 Consumer Confidence Report (CCR) due to our office, your customers, and the local health department, by July 1, 2015. 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

March 30, 2015

Recent changes to the Lead and Copper Rule 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 mark your second six month round of monitoring. 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.

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



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
2014 WATER SUPPLY CROSS CONNECTION REPORT

Issued under authority of 1976 PA 399, as amended, and the administrative rules.

Failure to submit this form is a violation of the Act and may subject the water supply to enforcement penalties.



28
ENTERED

Administrative Rule R 325.11405 states in part that "a water utility shall report annually to the department on the status of the cross connection control program on a form provided by the department." Return the completed form by March 31, 2015 to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

WSSN: 2310

- A. Name of water utility: City Of Flint County: Genesee
- B. Year that the current written cross connection control program was approved by DEQ: 1974
- C. Total number of industrial, commercial, institutional, residential, and governmental accounts that must be routinely reinspected for cross connections: 2012
Of this number,
- How many are High Hazard accounts: 313 Frequency of Reinspection: Once per Year
- How many are Low Hazard accounts: 1699 Frequency of Reinspection: Once per: 3/Years
- D. Number of accounts from line "C" that received an initial inspection in 2014: 12
- E. Total number of reinspections required and completed in 2014 based on degree of hazard:
- High hazard reinspections required: 313 High hazard reinspections completed: 197
- Low hazard reinspections required: 566 Low hazard reinspections completed: 374
- F. Number of accounts where a cross connection(s) was found to exist during inspections or reinspections in 2014: 41
- G. Number of accounts from line "F" where corrective actions have been completed: 41
- H. Total number of accounts from line "C" which are now in compliance with the local cross connection control program; $H = C - (F - G)$: 2012
- I. Total number of backflow prevention devices in system requiring testing: 1018
- J. Number of backflow prevention devices tested in 2014: 766

Narrative Description of Program

(Outline briefly any changes or significant findings since last reporting; use additional sheets if necessary.)

Budget, and personel constraints as well as added duties for the inspector, continue to be a challenge to the CCC Program in The City. We continue in our effortto move forward.

Name: Glenn Thomas

Title: Cross Connection Control Coordinator

Date: 3/23/2015

APR 07 2015

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
**ANNUAL PUMPAGE/USAGE REPORT FOR COMMUNITY WATER
SUPPLY**



Issued under authority of 1976 PA 399, MCL 325.1001 *et al.*, and Administrative Rules, as amended.
Failure to submit this form is a violation of Act 399 and may subject the water supply to enforcement penalties.

Administrative Rule R 325.11504 states in part that "...each Type I public water supply which does not submit a monthly operation report shall submit an annual report ... of water pumpage and water use." Complete this form and return it to the appropriate Department of Environmental Quality district office **by March 31** following the year covered by the report. For district office addresses, visit www.michigan.gov/deq and click on Locations. Add additional sheets as needed.

Water Supply: _____ City of Flint _____ WSSN: _____ 2310 _____ County: _____ Genesee _____

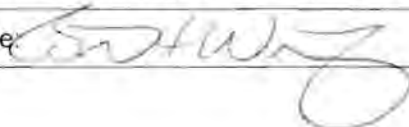
MONTHLY PUMPAGE/USAGE

Calendar Year _____	Well No. _____ Capacity in gpm _____	Well No. _____ Capacity in gpm _____	Well No. _____ Capacity in gpm _____	Well No. _____ Capacity in gpm _____	Total Monthly Pumpage/Usage ☒ in million gallons ☐ in gallons
JANUARY					476.53
FEBRUARY					573.37
MARCH					696.48
APRIL					565.01
MAY					576.89
JUNE					638.70
JULY					580.02
AUGUST					527.35
SEPTEMBER					535.40
OCTOBER					559.70
NOVEMBER					448.00
DECEMBER					467.30

Comments: _____

Total Yearly Pumpage/Usage	6,644.75
Average Daily Pumpage/Usage (Total Yearly Pumpage / 365)	18.20
Maximum Daily Pumpage And Date	24.46 Pumpage March 5, 2014 Date
Minimum Daily Pumpage And Date	12.5 Pumpage November 12, 2014 Date

Name/Title: Brent Wright/Plant Supervisor

Signature: 

Date: March 11, 2015





RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE



DAN WYANT
DIRECTOR

November 9, 2015

Mr. Michael Glasgow
Utilities Administrator
City of Flint
4500 North Dort Highway
Flint, Michigan 48505

WSSN: #2310

Dear Mr. Glasgow:

SUBJECT: Water Supply – City of Flint (City) – Compliance Communication
Lead and Copper Rule Compliance Sampling Sites

The City community water system is subject to the requirements of the Michigan Safe Drinking Water Act, 1976 Public Act 399, as amended (Act 399). According to Department of Environmental Quality (DEQ) records, City reports submitted to the DEQ regarding Lead and Copper Rule (LCR) compliance monitoring information have been certified by the City that all LCR compliance monitoring since 1992 has been conducted at sampling sites meeting the Tier 1 criteria listed under subrule 1c of administrative rule 710a (R325.10710a).

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Therefore, the DEQ is hereby requesting the City provide additional information and documentation regarding all 324 historic LCR compliance sampling sites.

As of November 3, 2015, the City's electronic database of customer service connections listed 10,895 records of converted customer service connection index cards. The City has recently indicated it has a total of 29,072 customer service connections, leaving approximately 18,177 records left to be converted. These digital records include a listing of the service line material.

The DEQ has obtained a copy of these 10,895 digital records and cross referenced them with the addresses for the City's 324 historic LCR compliance monitoring sites. However, only 46 of the 324 sites were able to be matched at the current time. Of these 46 sites, only 6 sites contained information confirming the Tier 1 site criteria based on having lead service line materials. 14 sites were listed as having no available information (n/a), and require additional documentation to justify being designated as a Tier 1 sample site having a lead service line. The remaining 26 cross referenced sites were listed as having copper service line materials which directly conflicts with the City's LCR reports certifying these sites as Tier 1 based on the criteria of having a lead service line. The City needs to provide additional information to the DEQ demonstrating these sites meet the Tier 1 site criteria or we will assume they do not.

The City's remaining 278 historic LCR compliance sampling sites must also be reviewed and will require additional documentation to justify being designated as Tier 1 sample sites.

Mr. Michael Glasgow

2

November 9, 2015

Our office has provided the enclosed table that lists all 324 of the City's historic LCR compliance monitoring sites, when each site was utilized, the City's certification information for each site, and information cross referenced from the City's customer service line database. The City can use the far right column in this table, labeled *Justification of Lead Service Line and Tier 1 Criteria*, to summarize the City's justification for certifying these sites as Tier 1 and having a lead service line. Any supporting documentation regarding the justification for each site needs to be provided as separate attachments.

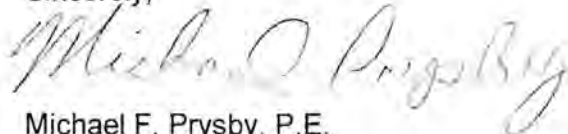
As a reminder, in accordance with subrule 1 of administrative rule 710a (R325.10710a), by January 1, 1992, the City was to have completed a materials evaluation of its distribution system to identify a pool of targeted sampling sites from which all first draw samples are collected. This evaluation was required to include information from:

- Special Monitoring for Corrosivity Characteristics
- All plumbing codes, permits, and records in the files of the building department or departments that indicate the plumbing materials installed within publically and privately owned structures connected to the water distribution system.
- All inspections and records of the distribution system indicating material composition of customer service connections.
- Water quality information that indicates locations which may be particularly susceptible to high lead or copper concentrations.

The completed table and all supporting documentation must be provided to our office as soon as possible, but by no later than December 30, 2015, prior to the next LCR compliance monitoring period.

Please contact me at 517-290-8817 or prysbym@michigan.gov at your earliest convenience to discuss this matter in more detail.

Sincerely,



Michael F. Prysby, P.E.
District Engineer
Lansing District Office
Office of Drinking Water and
Municipal Assistance

cc: Mr. Robert Bisnick, City of Flint
Mr. Brent Wright, City of Flint
Mr. Howard Kroft, City of Flint
Ms. Natasha Henderson, City of Flint
Mr. Jim Sygo, Chief Deputy Director, DEQ
Mr. Stephen Busch, DEQ
Mr. Adam Rosenthal, DEQ



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
**LEAD AND COPPER REPORT AND
CONSUMER NOTICE OF LEAD RESULT
CERTIFICATE FOR COMMUNITY WATER SUPPLY**



Issued under authority of 1976 PA 399, MCL 325.1001 *et al.*, and Administrative Rules, as amended.
Failure to submit this information is a violation of Act 399 and may subject the water supply to enforcement penalties.

Administrative Rule R 325.10710d requires water supplies to report lead and copper monitoring information within 10 days after the end of the monitoring period. This form may be used to meet this requirement. Submit the information to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

1. Water Supply Name: City of Flint Water Plant
2. County: Genesee 3. WSSN: 2310
4. Population: 99,763 5. Monitoring Period: From: 1/1/15 To: 6/30/15
6. Minimum # of Samples Required: 60 7. # of Samples Taken: 69
8. Name of Certified Laboratory: DEQ Drinking Water Laboratory

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.
☐	☒	a. Are the same sampling points used as in the previous monitoring period?
☐	☒	b. Are all samples from Tier 1 sites?
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?

For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

Comments: Revised report after conference call with DEQ staff. Two samples were removed from list for not meeting sample criteria, and due to population the number of samples required was reduced to 60.

10. NAME:

Name: Michael Glasgow
Title: Utilities Administrator Phone: 810-766-7135 Date: 8/20/2015

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water PlantWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2205 Flusing Rd	2/15/15	1	L	C,P	N.D.	0.13	54663
1809 Stevenson St.	2/10/15	1	L	P	10	N.D.	54956
4202 Custer Ave.	3/4/15	1	L	C,P	6	0.27	56223
401 E. Newall St.	3/2/15	1	L	P	5	N.D.	56225
215 Browning Ave.	3/21/15	1	L	C,P	N.D.	0.16	56226
2615 Trumbull Ave.	2/27/15	1	L	C,P	3	N.D.	56227
201 Browning Ave.	3/5/15	1	L	P	N.D.	N.D.	56228
1224 Decker St.	3/17/15	1	L	C,P	13	0.10	57728
1220 Decker St.	3/17/15	1	L	P	4	N.D.	57730
1379 Washington Ave.	3/19/15	1	L	P	8	N.D.	57731
1383 Washington Ave.	3/19/15	1	L	C,P	6	0.17	57734
1372 Washington Ave.	3/19/15	1	L	C,P	2	0.14	57733
1367 Washington Ave.	3/17/15	1	L	P	1	N.D.	57735
1701 Marquette Dr.	3/14/15	1	L	C,P	1	0.19	57736
778 Bundy Ave.	3/24/15	1	L	P	N.D.	N.D.	58413
3714 Beecher Rd.	3/24/15	1	L	C	2	0.52	58414
1016 Ingleside Ave.	4/9/15	1	L	C,P	7	0.07	59749
1818 Rock Creek Ln.	4/6/15	1	L	C,P	3	0.11	59750
3010 Cheyenne St.	4/3/15	1	L	C,P	5	0.10	59751
2606 Mountain Ave.	4/15/2015	1	L	P	N.D.	N.D.	60546

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant

WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
2020 Crooked Ln.	4/24/15	1	L	C,P	5	0.10	61845
310 E. Moore St.	4/22/15	1	L	P	5	N.D.	61846
631 Alvord Ave.	5/6/15	1	L	P	42	N.D.	63410
216 Browning Ave.	5/7/15	1	L	C,P	22	0.31	63411
3714 Beecher Rd.	5/14/15	1	L	C,P	8	0.15	64283
912 Lexington Ave.	5/15/15	1	L	P	6	N.D.	64285
349 Robbie Ln.	5/31/15	1	L	P	2	N.D.	67428
353 Robbie Ln.	5/30/15	1	L	C,P	5	0.11	67427
341 Robbie Ln.	5/31/15	1	L	C,P	3	0.05	67426
328 Robbie Ln.	5/30/15	1	L	C,P	2	0.09	67425
357 Robbie Ln.	5/31/15	1	L	C	3	0.20	67424
344 Robbie Ln.	5/31/15	1	L	C,P	4	0.11	67423
1807 Oren Ave.	6/8/15	1	L	P	21	N.D.	68023
421 Lyon St.	6/14/15	1	L	C,P	7	0.14	68788
1528 Delaware Ave.	6/12/15	1	L	P	3	N.D.	68789
3811 Brentwood Dr.	6/14/15	1	L	P	42	N.D.	68790
1615 S. Franklin Ave.	6/14/15	1	L	P	N.D.	N.D.	68791
853 E. 7th St.	6/12/15	1	L	C,P	7	0.07	68792
1150 Woodside Dr.	6/14/15	1	L	P	29	N.D.	68793
547 Copeman Blvd.	6/15/14	1	L	P	18	N.D.	68794

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water PlantWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2114 Flushing Rd.	6/30/15	1	L	P	5	0.05	71170
709 Frost St.	6/30/15	1	L	P	2	N.D.	72033
920 Stocker Ave.	6/21/15	1	L	P	1	N.D.	69622
742 Lincoln Ave.	6/19/15	1	L	P	2	N.D.	69623
3517 Bennett Ave.	6/24/15	1	L	C,P	3	0.06	69624
1730 Overhill Dr.	6/22/15	1	L	C,P	1	0.08	69625
2117 Stanford Ave.	6/23/15	1	L	C,P	5	0.08	69626
2432 Beta Ln.	6/21/15	1	L	P	N.D.	N.D.	69627
2023 Miller Rd.	6/21/15	1	L	C,P	3	0.06	69628
721 East St. Apt #2	6/25/15	4	L	C,P	10	0.16	70222
3814 Whitter	6/25/15	1	L	P	2	N.D.	70223
3120 Norwood	6/24/15	1	L	P	5	N.D.	70224
2122 Pierce St.	6/21/15	1	L	P	2	N.D.	70225
3521 Bennett Ave.	6/25/15	1	L	P	3	N.D.	70226
1602 Raspberry Ln.	6/24/15	1	L	P	N.D.	N.D.	70227
1809 Lynbrook	6/26/15	1	L	P	3	N.D.	70228
2112 Sherff	6/24/15	1	L	C,P	9	0.06	70229
1205 Blanchard Ave.	6/24/15	1	L	C,P	11	0.05	70230
860 Schafer St.	6/26/15	1	L	C,P	N.D.	0.06	70231
2110 Flushing Rd.	6/30/15	1	L	C	N.D.	0.10	71158

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water PlantWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2300 Flushing Rd.	6/29/15	1	L	C	3	0.28	71159
2130 Flushing Rd.	6/28/15	1	L	C,P	6	0.05	71160
2202 Flushing Rd.	6/29/15	1	L	C,P	2	0.06	71162
2429 Flushing Rd.	6/30/15	1	L	C,P	N.D.	0.06	71163
4013 Brownell Blvd.	6/29/15	1	L	C,P	2	0.08	71165
2414 Flushing Rd.	6/30/15	1	L	P	N.D.	N.D.	71166
1914 Penbrook Ln	6/29/15	1	L	P	2	N.D.	71167
3901 Leedra St.	6/26/15	1	L	P	N.D.	N.D.	71168
3142 McClure	6/26/15	1	L	P	3	N.D.	71169

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

Consumer Notice of Lead Result in Drinking Water

Water Supply Name:	City of Flint		
County:	Genesee	WSSN:	2310
Sample Location:	401 E. Newall St.	Date Sampled:	3/2/15

Thank you for participating in the lead and copper monitoring of drinking water. The levels of lead and copper found at your location are in the table below.

Key to Table	Contaminant	AL	MCLG	Your Result
Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. ppb: parts per billion or micrograms per liter.	Lead (ppb)	15	0	5
	Copper (ppb)	1300	1300	Not Detected

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and it can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

To reduce exposure to lead in drinking water:

- *Run your water to flush out lead.* Run the water until it becomes cold.
- *Use cold water for cooking and preparing baby formula.* Do not cook with or drink water from the hot water tap; lead dissolves more easily in hot water.
- *Do not boil water to remove lead.* Boiling water will not reduce lead levels.
- *Look for alternative sources or treatment of water.* If your lead result is above 15 ppb, you may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010, or www.nsf.org for information on performance standards for water filters.
- *Identify if your plumbing fixtures contain lead.* New faucets, fittings, and valves, may contain up to 8 percent lead including those advertised or labeled as "lead-free" and may contribute lead to drinking water. Consumers should be aware of this when choosing fixtures and take appropriate precautions.

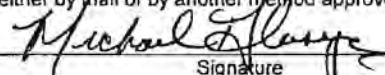
Although the primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated soil, the U.S. EPA estimates that 10 to 20 percent of human exposure to lead may come from drinking water.

For more information, contact us at: City of Flint Water Plant (810) 787-6537

For more information on reducing lead exposure around your home and the health effects of lead, visit the U.S. EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Certification:

I certify that this public water supply has provided the consumer notice of lead result to persons served at each of the taps that was tested, either by mail or by another method approved by the DEQ, within 30 days of knowing the result. The Notice includes required content.

 Signature	UTILITIES ADMINISTRATOR Title	WSSN: <u>2310</u> Date Sent to Consumer: <u>3/17/15</u>
--	----------------------------------	--

Reminder to water supplier: Complete this certification on only one (1) example copy of a notice sent to a consumer and submit it to the DEQ.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
**LEAD AND COPPER REPORT AND
CONSUMER NOTICE OF LEAD RESULT
CERTIFICATE FOR COMMUNITY WATER SUPPLY**

DRAFT **DEQ**

Issued under authority of 1976 PA 399, MCL 325.1001 et al., and Administrative Rules, as amended.

Failure to submit this information is a violation of Act 399 and may subject the water supply to enforcement penalties.

Administrative Rule R 325.10710d requires water supplies to report lead and copper monitoring information within 10 days after the end of the monitoring period. This form may be used to meet this requirement. Submit the information to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

1. Water Supply Name: City of Flint Water Plant
2. County: Genesee 3. WSSN: 2310
4. Population: 99,763 5. Monitoring Period: From: 1/1/15 To: 6/30/15
6. Minimum # of Samples Required: 100 7. # of Samples Taken: 71
8. Name of Certified Laboratory: DEQ Drinking Water Laboratory

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.
☐	☒	a. Are the same sampling points used as in the previous monitoring period?
☐	☒	b. Are all samples from Tier 1 sites?
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?

For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

Comments:
A total of 175 sample bottles and instructions were distributed to city residents. We are continuing to solicit samples due to the fact that we did not reach the minimum number for this monitoring period.

Lead service - majority (2015)

10. NAME:

Name: Michael Glasgow

Title: Utilities Administrator Phone: 810-766-7135 Date: 7/28/2015

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water PlantWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2205 Flusing Rd	2/15/15	1	L	C,P	N.D.	0.13	54663
212 Browning Ave.	2/18/15	1	L	P	104	N.D.	54945
1809 Stevenson St.	2/10/15	1	L	P	10	N.D.	54956
4202 Custer Ave.	3/4/15	1	L	C,P	6	0.27	56223
401 E. Newall St.	3/2/15	1	L	P	5	N.D.	56225
215 Browning Ave. <i>ok</i>	3/21/15	1	L	C,P	N.D.	0.16	56226
2615 Trumbull Ave.	2/27/15	1	L	C,P	3	N.D.	56227
201 Browning Ave. <i>ok</i>	3/5/15	1	L	P	N.D.	N.D.	56228
1224 Decker St.	3/17/15	1	L	C,P	13	0.10	57728
1220 Decker St.	3/17/15	1	L	P	4	N.D.	57730
1379 Washington Ave.	3/19/15	1	L	P	8	N.D.	57731
1383 Washington Ave.	3/19/15	1	L	C,P	6	0.17	57734
1372 Washington Ave.	3/19/15	1	L	C,P	2	0.14	57733
1367 Washington Ave.	3/17/15	1	L	P	1	N.D.	57735
1701 Marquette Dr.	3/14/15	1	L	C,P	1	0.19	57736
778 Bundy Ave.	3/24/15	1	L	P	N.D.	N.D.	58413
3714 Beecher Rd.	3/24/15	1	L	C	2	0.52	58414
1016 Ingleside Ave.	4/9/15	1	L	C,P	7	0.07	59749
1818 Rock Creek Ln.	4/6/15	1	L	C,P	3	0.11	59750
3010 Cheyenne St.	4/3/15	1	L	C,P	5	0.10	59751

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

DRAFT

Water Supply Name/County City of Flint Water PlantWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
2606 Mountain Ave.	4/15/15	1	L	P	N.D.	N.D.	60546
2020 Crooked Ln.	4/24/15	1	L	C,P	5	0.10	61845
310 E. Moore St.	4/22/15	1	L	P	5	N.D.	61846
631 Alvord Ave.	5/6/15	1	L	P	42	N.D.	63410
216 Browning Ave.	5/7/15	1	L	C,P	22	0.31	63411
3714 Beecher Rd.	5/14/15	1	L	C,P	8	0.15	64283
625 S. Grand Traverse	5/18/15	5	L	C,P	20	0.14	64284 X
912 Lexington Ave.	5/15/15	1	L	P	6	N.D.	64285
349 Robbie Ln.	5/31/15	1	L	P	2	N.D.	67428
353 Robbie Ln.	5/30/15	1	L	C,P	5	0.11	67427
341 Robbie Ln.	5/31/15	1	L	C,P	3	0.05	67426
328 Robbie Ln.	5/30/15	1	L	C,P	2	0.09	67425
357 Robbie Ln.	5/31/15	1	L	C	3	0.20	67424
344 Robbie Ln.	5/31/15	1	L	C,P	4	0.11	67423
1807 Oren Ave.	6/8/15	1	L	P	21	N.D.	68023
421 Lyon St.	6/14/15	1	L	C,P	7	0.14	68788
1528 Delaware Ave.	6/12/15	1	L	P	3	N.D.	68789
3811 Brentwood Dr.	6/14/15	1	L	P	42	N.D.	68790
1615 S. Franklin Ave.	6/14/15	1	L	P	N.D.	N.D.	68791
853 E. 7 th St.	6/12/15	1	L	C,P	7	0.07	68792

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper, G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water PlantWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
1150 Woodside Dr.	6/14/15	1	L	P	29	N.D.	68793
547 Copeman Blvd.	6/14/15	1	L	P	18	N.D.	68794
920 Stocker Ave.	6/21/15	1	L	P	1	N.D.	69622
742 Lincoln Ave.	6/19/15	1	L	P	2	N.D.	69623
3517 Bennett Ave.	6/24/15	1	L	C,P	3	0.06	69624
1730 Overhill Dr.	6/22/15	1	L	C,P	1	0.08	69625
2117 Stanford Ave.	6/23/15	1	L	C,P	5	0.08	69626
2432 Beta Ln.	6/21/15	1	L	P	N.D.	N.D.	69627
2023 Miller Rd.	6/21/15	1	L	C,P	3	0.06	69628
721 East St. Apt #2	6/25/15	4	L	C,P	10	0.16	70222
3814 Whitter	6/25/15	1	L	P	2	N.D.	70223
3120 Norwood	6/24/15	1	L	P	5	N.D.	70224
2122 Pierce St.	6/21/15	1	L	P	2	N.D.	70225
3521 Bennett Ave.	6/25/15	1	L	P	3	N.D.	70226
1602 Raspberry Ln.	6/24/15	1	L	P	N.D.	N.D.	70227
1809 Lynbrook	6/26/15	1	L	P	3	N.D.	70228
2112 Sherff	6/24/15	1	L	C,P	9	0.06	70229
1205 Blanchard Ave.	6/24/15	1	L	C,P	11	0.05	70230
860 Schafer St.	6/26/15	1	L	C,P	N.D.	0.06	70231
2110 Flushing Rd.	6/30/15	1	L	C	N.D.	0.10	71158

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water PlantWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2300 Flushing Rd.	6/29/15	1	L	C	3	0.28	71159
2130 Flushing Rd.	6/28/15	1	L	C,P	6	0.05	71160
2202 Flushing Rd.	6/29/15	1	L	C,P	2	0.06	71162
2429 Flushing Rd.	6/30/15	1	L	C,P	N.D.	0.06	71163
4013 Brownell Blvd.	6/29/15	1	L	C,P	2	0.08	71165
2414 Flushing Rd.	6/30/15	1	L	P	N.D.	N.D.	71166
1914 Penbrook Ln	6/29/15	1	L	P	2	N.D.	71167
3901 Leedra St.	6/26/15	1	L	P	N.D.	N.D.	71168
3142 McClure	6/26/15	1	L	P	3	N.D.	71169
2114 Flushing Rd.	6/30/15	1	L	C,P	5	0.05	71170
709 Frost St.	6/30/15	1	L	P	2	N.D.	72033

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

Consumer Notice of Lead Result in Drinking Water

Water Supply Name:	City of Flint	
County:	Genesee	WSSN: 2310
Sample Location:	401 E. Newall St.	Date Sampled: 3/2/15

Thank you for participating in the lead and copper monitoring of drinking water. The levels of lead and copper found at your location are in the table below.

Key to Table	Contaminant	AL	MCLG	Your Result
Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. ppb: parts per billion or micrograms per liter.	Lead (ppb)	15	0	5
	Copper (ppb)	1300	1300	Not Detected

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and it can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

To reduce exposure to lead in drinking water:

- *Run your water to flush out lead.* Run the water until it becomes cold.
- *Use cold water for cooking and preparing baby formula.* Do not cook with or drink water from the hot water tap; lead dissolves more easily in hot water.
- *Do not boil water to remove lead.* Boiling water will not reduce lead levels.
- *Look for alternative sources or treatment of water.* If your lead result is above 15 ppb, you may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010, or www.nsf.org for information on performance standards for water filters.
- *Identify if your plumbing fixtures contain lead.* New faucets, fittings, and valves, may contain up to 8 percent lead including those advertised or labeled as "lead-free" and may contribute lead to drinking water. Consumers should be aware of this when choosing fixtures and take appropriate precautions.

Although the primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated soil, the U.S. EPA estimates that 10 to 20 percent of human exposure to lead may come from drinking water.

For more information, contact us at: City of Flint Water Plant (810) 787-6537

For more information on reducing lead exposure around your home and the health effects of lead, visit the U.S. EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Certification:

I certify that this public water supply has provided the consumer notice of lead result to persons served at each of the taps that was tested, either by mail or by another method approved by the DEQ, within 30 days of knowing the result. The Notice includes required content.

Michael Flanagan
Signature

UTILITIES ADMINISTRATOR
Title

WSSN: **2310**

3/17/15
Date Sent to Consumer

Reminder to water supplier: Complete this certification on only one (1) example copy of a notice sent to a consumer and submit it to the DEQ.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE
**LEAD AND COPPER REPORT AND
CONSUMER NOTICE OF LEAD RESULT
CERTIFICATE FOR COMMUNITY WATER SUPPLY**



Issued under authority of 1976 PA 399, MCL 325.1001 *et al.*, and Administrative Rules, as amended.
Failure to submit this information is a violation of Act 399 and may subject the water supply to enforcement penalties.

Administrative Rule R 325.10710d requires water supplies to report lead and copper monitoring information within 10 days after the end of the monitoring period. This form may be used to meet this requirement. Submit the information to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

1. Water Supply Name: City of Flint
2. County: Genesee 3. WSSN: 2310
4. Population: _____ 5. Monitoring Period: From: 7/1/2014 To: 12/31/2014
6. Minimum # of Samples Required: 100 7. # of Samples Taken: 100
8. Name of Certified Laboratory: MDEQ Drinking Water Laboratory

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.
☐	☒	a. Are the same sampling points used as in the previous monitoring period?
☐	☒	b. Are all samples from Tier 1 sites?
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?

For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

Comments: The increased number of samples required has led to many new sample sites.

10. NAME:

Name: Michael Glasgow
Title: Assistant Water Plant Supervisor Phone: (810)787-6537 Date: 2/27/15

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint / GeneseeWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2205 Flushing Rd. ✓	11/19/14	1	L		N.D.	110	
3814 Whitter Ave. ✓	11/20/14	1	L		2	N.D.	
3521 Bennett Ave ✓	11/21/14	1	L		2	N.D.	
1914 Penbrook Ln ✓	11/20/14	1	L		N.D.	N.D.	
305 Allendale Pl. ✓	11/24/14	1	L		2	130	
518 Frost St. ✓	12/1/14	1	L		1	N.D.	
3120 Norwood Dr. ✓	12/2/14	1	L		N.D.	N.D.	
1901 Crestbrook Ln. ✓	11/25/14	1	L		N.D.	70	
3727 Maryland Ave. ✓	12/3/14	1	L		1	N.D.	
1220 Beard St. ✓	12/2/14	1	L		10	60	
3718 Dolphaine Ln ✓	12/3/14	1	L		N.D.	N.D.	
2213 Flushing Rd ✓	12/3/2014	1	L		1	100	
721 East St. ✓	12/10/14	1	L		9	120	
1125 Barrie Ave ✓	12/5/14	1	L		4	N.D.	
1505 Woodlawn Park Dr. ✓	12/6/2014	1	L		5	N.D.	
2622 Windmere ✓	12/7/14	1	L		5	N.D.	
3517 Bennett ✓	12/10/14	1	L		3	N.D.	
927 Kensington Ave. ✓	12/5/14	1	L		N.D.	110	
1109 Kensington Ave. ✓	12/4/14	1	L		N.D.	N.D.	
1901 Montclair Ave. ✓	12/5/14	1	L		4	60	

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint / GeneseeWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
1809 Lynbrook ✓	12/4/14	1	L		2	N.D.	
1130 Simcoe Ave. ✓	12/5/14	1	L		2	50	
413 Burroughs Ave ✓	12/4/14	1	L		N.D.	N.D.	
2079 Zimmerman ✓	12/8/14	1	L		4	N.D.	
2615 Westwood Pkwy ✓	12/6/14	1	L		2	280	
2441 Norbert ✓	12/8/14	1	L		8	60	
711 Kensington Ave. ✓	12/9/14	1	L		3	N.D.	
2015 Gold Ave. ✓	12/4/14	1	L		2	N.D.	
618 S. Meade St. ✓	12/8/14	1	L		2	N.D.	
2802 Westwood Pkwy. ✓	12/5/14	1	L		1	110	
860 Schafer St. ✓	12/8/14	1	L		N.D.	70	
1021 S. Franklin Ave. ✓	12/5/14	1	L		4	N.D.	
1616 Durand St. ✓	12/5/14	1	L		N.D.	200	
928 Durand	12/7/14	1	L		N.D.	N.D.	
2730 Westwood Pkwy ✓	12/4/14	1	L		23	290	
1543 Kearsley Park Blvd. ✓	12/4/14	1	L		1	N.D.	
2920 Parkside Dr. ✓	12/5/14	1	L		10	220	
2721 Westwood Pkwy ✓	12/5/14	1	L		2	110	
1002 Durand St. ✓	12/4/14	1	L		2	110	
2560 Thomas St. ✓	12/4/14	1	L		N.D.	N.D.	

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint / GeneseeWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
815 Bradley Ave. ✓	12/7/14	1	L		5	270	
4013 Brownell Blvd. ✓	12/8/14	1	L		2	80	
2418 Gold Ave. ✓	12/10/14	1	L		N.D.	N.D.	
626 Commonwealth Ave ✓	12/5/14	1	L		3	N.D.	
920 Stocker St. ✓	12/9/14	1	L		N.D.	N.D.	
430 Westcombe Ave. ✓	12/9/14	1	L		2	N.D.	
1623 Neome Dr. ✓	12/5/14	1	L		7	70	
3802 Gorey Ave. ✓	12/8/14	1	L		1	50	
1720 Davison Rd. ✓	12/4/14	1	L		2	130	
2110 Mountain Ave. ✓	12/8/14	1	L		5	60	
2006 Clement St. ✓	12/3/14	1	L		3	N.D.	
2028 Corunna Rd. ✓	12/7/14	1	L		N.D.	N.D.	
2829 Yale St. ✓	12/10/14	1	L		N.D.	N.D.	
1914 W. Home Ave. ✓	12/15/14	1	L		4	N.D.	
2920 N. Dexter St. ✓	12/15/14	1	L		N.D.	70	
2810 Kellar Ave. ✓	12/15/14	1	L		N.D.	N.D.	
3245 Montana Ave. ✓	12/15/14	1	L		4	N.D.	
3623 Norwood Dr. ✓	12/15/14	1	L		1	N.D.	
2801 Reynolds ✓	12/8/14	1	L		2	N.D.	
3510 Brandon St. ✓	12/10/14	1	L		5	80	

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint / Genesee

WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2117 Stanford Ave. ✓	12/11/14	1	L		3	N.D.	
5806 Leslie Dr. ✓	12/12/14	1	L		N.D.	N.D.	
1809 W. Home Ave. ✓	12/11/14	1	L		1	N.D.	
1414 Stone St. ✓	12/12/14	1	L		2	N.D.	
2006 Aitken Ave. ✓	12/16/14	1	L		N.D.	N.D.	
3131 Wolcott ✓	12/17/14	1	L		N.D.	N.D.	
983 Gainey Ave. ✓	12/17/14	1	L		N.D.	100	
2806 Norbert St. ✓	12/18/14	1	L		N.D.	N.D.	
912 Crawford St. ✓	12/15/14	1	L		1	110	
4024 Sterling ✓	12/16/14	1	L		1	N.D.	
3737 Worchester Dr. ✓	12/16/14	1	L		N.D.	140	
1100 Stockton St. ✓	12/16/14	1	L		6	N.D.	
1725 Lincoln Ave. ✓	12/21/14	1	L		2	N.D.	
3139 Colorado ✓	12/16/14	1	L		N.D.	N.D.	
1401 Gainey Ave. ✓	12/20/14	1	L		4	N.D.	
2730 Coventry Ct. ✓	12/19/14	1	L		N.D.	N.D.	
709 Frost St. ✓	12/19/14	1	L		N.D.	N.D.	
2307 Radcliffe ✓	12/20/14	1	L		37	80	
224 E. Court St. ✓	12/15/14	1	L		4	N.D.	
3440 Rangeley ✓	12/13/14	1	L		N.D.	N.D.	

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint / GeneseeWSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
3808 Brownell Blvd. ✓	12/16/14	1	L		N.D.	90	
1006 Kensington ✓	12/19/14	1	L		2	N.D.	
2517 Delaware Ave. ✓	12/18/14	1	L		5	200	
1810 W. Hobson Ave. ✓	12/21/14	1	L		N.D.	N.D.	
5805 Leslie Dr. ✓	12/21/14	1	L		2	N.D.	
1721 Chelsea Circle ✓	12/22/14	1	L		N.D.	N.D.	
912 Waldman Ave. ✓	12/23/14	1	L		N.D.	N.D.	
3082 Lanning Dr. ✓	12/24/14	1	L		N.D.	N.D.	
25151 Chicago Blvd. ✓	12/26/14	1	L		6	N.D.	
742 Lincoln Ave. ✓	12/26/14	1	L		3	N.D.	
1805 Ramsay Blvd. ✓	12/27/14	1	L		4	N.D.	
1910 Ramsay Blvd. ✓	12/20/14	1	L		N.D.	N.D.	
3009 Montana Ave. ✓	12/29/14	1	L		1	N.D.	
1223 Campbell St. ✓	12/30/14	1	L		1	N.D.	
3821 Delaware ✓	12/27/14	1	L		N.D.	N.D.	
1651 Woodlawn Pk Blvd. ✓	12/29/14	1	L		N.D.	N.D.	
1911 Corry St. ✓	12/30/14	1	L		4	N.D.	
3507 Dearborn Ave. ✓	12/20/14	1	L		6	N.D.	
3829 Ivanhoe Ave. ✓	12/29/14	1	L		N.D.	N.D.	
1559 Chevrolet Ave. ✓	12/30/14	1	L		9	N.D.	

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90 th percentile	Ave	Max	# > AL
Pb	6.0			2
Cu	110			0

Consumer Notice of Lead & Copper Results in Drinking Water

Water Supply Name: City of Flint

County: Genesee WSSN: 2310

Sample Location 2205 Flushing Rd. Date Sampled: 11/19/2014

Thank you for participating in the lead and copper monitoring of drinking water. The levels of lead and copper found at your location are in the table below.

Key to Table	Contaminant	AL	MCLG	Your Result
Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water which there is no known or expected risk to health. MCLG's allow for a margin of safety. ppb: parts per billion or micrograms per liter.	Lead (ppb)	15	0	Not Detected
	Copper (ppb)	1300	1300	110

Lead can cause serious health problem if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and it can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects on the brain with lower IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

To reduce exposure to lead in drinking water:

- Run your water to flush out lead. Run the water until it becomes cold.
- Use cold water for cooking and preparing baby formula. Do not cook with or drink water from the hot tap; lead dissolves more easily in hot water.
- Do not boil water to remove lead. Boiling water will not reduce lead levels.
- Look for an alternative sources or treatment of water. If your lead result is above 15 ppb, you may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010, or www.nsf.org for information on performance standards for water filters.
- Identify if your plumbing fixtures contain lead. New faucets, fittings, and valves, may contain up to 8 percent lead including those advertised as "lead-free" and may contribute lead to drinking water. Consumers should be aware of this when choosing fixtures and take appropriate precautions.

Although the primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead contaminated soil, the U.S. EPA estimates that 10 to 20 percent of human exposure to lead may come from drinking water.

For more information, contact us at: City of Flint Water Plant (810)787-6537.

For more information on reducing lead exposure around your home and the health effects of lead, visit the U.S. EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.





RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

January 13, 2012

Mr. Brent Wright
City Of Flint - D P W
Flint Water Plant
4500 North Dort Highway
Flint, MI 48505

Dear Mr. Wright:

Subject: City Of FlintWSSN: 02310
Lead and Copper Monitoring of Drinking Water Taps

We received your report for the monitoring period June 1, 2011 through September 30, 2011.

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)	0 ppb	0	23	6/1 and 9/30/2014 Submit results to this office by October 10, 2014
Copper 1.3 parts per million (ppm)	0.097 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 2011 Consumer Confidence Report (CCR) due to our office, your customers and the local health department by July 1, 2012. 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. 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 or at <http://www.epa.gov/safewater/lead>.

You must also provide individual lead tap results to the people who receive water from sites that were sampled, even if lead was not detected. This is a new requirement under U.S. EPA revisions to the Lead and Copper Rule of October 10, 2007. The new rule requires you to deliver notices of lead results to customers within 30 days of learning of each individual result and to deliver a certification that delivery requirements were met along with a sample copy of your customer notice to this office within 3 months of the end of the monitoring period. A

template and certificate is downloadable in Microsoft Word and PDF formats from www.michigan.gov/deq. Click on Water, Drinking Water, Community Water Supply, Reporting Forms, and *Lead and Copper Report and Consumer Notice of Lead Result Certificate*.

Samples due the next monitoring period continue your triennial monitoring. 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.

Bottles will NOT be mailed automatically. To order bottles, call the DEQ Laboratory at 517-335-8184 or download the form EQP 2301 *Requisition for Water Sample Units* from www.michigan.gov/deq. Click on Key Topics, Laboratory Services, Drinking Water, Obtaining The Necessary Sampling Units, and test list.

Please contact the Detroit Water and Sewerage Department (DWSD) or Genesee County Water and Waste for sample bottles, reporting forms, and the schedule for accepting samples for analysis. Thank you for your cooperation.

Sincerely,



Michael F. Prysby, P.E., District Engineer
Field Operations
Resource Management Division
517-335-6122



Adam Rosenthal, EQA
Field Operations
Resource Management Division
517-335-6131

MFP:AR:JR

Enclosures

cc: Mr. Michael Glasgow, Laboratory & Water Quality Supervisor

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 RESOURCE MANAGEMENT DIVISION
**LEAD AND COPPER REPORT AND
 CONSUMER NOTICE OF LEAD RESULT
 CERTIFICATE FOR COMMUNITY WATER SUPPLY**



Issued under authority of 1976 PA 399 and Administrative Rules, as amended.

Failure to submit this information is a violation of the Act and may subject the water supply to enforcement penalties.

Administrative Rule R 325.10710d requires water supplies to report lead and copper monitoring information within 10 days after the end of the monitoring period. This form may be used to meet this requirement. Submit the information to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Contacts.

1. Water Supply Name: City Of Flint
 2. County: Genesee 3. WSSN: 02310
 4. Population: 124943 5. Monitoring Period: From: 6/1/2014 To: 9/30/2014
 on: _____
 6. Minimum # of Samples Required: 23 7. # of Samples Taken: _____
 8. Name of Certified Laboratory: _____

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.
☐	☐	a. Are the same sampling points used as in the previous monitoring period?
☐	☐	b. Are all samples from Tier 1 sites?
☐	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?
☐	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?
☐	☐	e. Is the minimum number of lead service line samples taken (when applicable)?

Comments:

10. NAME:

Name: _____

Title: _____

Phone: _____

Date: _____

12. **CONSUMER NOTICE OF LEAD RESULT CERTIFICATION:** Each Community Water Supply (CWS) must deliver a consumer notice of lead result to occupants of each location sampled within 30 days of knowing the sample result under 40 CFR §141.85 of the Lead and Copper Rule Short Term Regulatory Revisions and Clarifications. A template of the notice is available on the next page.

Not later than 3 months following the end of the monitoring period, each CWS must mail a sample copy of the consumer notice of lead result to the DEQ along with a certification that the notice has been distributed under 40 CFR §141.91(f)(3). This sheet (page 3) may be used to meet the certification requirement. Submit this certification sheet along with a sample copy of a notice sent to consumers to the appropriate DEQ district office. For district office addresses, visit www.michigan.gov/deq and click on Contacts.

I certify that this public water supply has provided the consumer notice of lead result to persons served at each of the taps that was tested, either by mail or by another method approved by the DEQ, within 30 days of knowing the result. Attached is a sample of the notice I sent to consumers. It includes:

- The result of lead tap water monitoring for the tap that was tested.
- An explanation of the health effects of lead.
- Steps consumers can take to reduce exposure to lead in drinking water.
- Contact information for the public water supply.
- The maximum contaminant level goal and the action level for lead and the definitions for these two terms.

Water Supply Name: City Of Flint

County: Genesee WSSN: 02310

Signature: _____

Printed Name: _____

Title: _____ Phone: _____ Date: _____

Consumer Notice of Lead Result in Drinking Water

Water Supply Name: City Of Flint

County: Genesee WSSN: 02310

Sample Location: _____ Date Sampled: _____

Thank you for participating in the lead and copper monitoring of drinking water. The levels of lead and copper found at your location are in the table below.

Key to Table	Contaminant	AL	MCLG	Your Result
Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. ppb: parts per billion or micrograms per liter.	Lead (ppb)	15	0	
	Copper (ppb)	1300	1300	

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and it can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

To reduce exposure to lead in drinking water:

- *Run your water to flush out lead.* Run the water until it becomes cold.
- *Use cold water for cooking and preparing baby formula.* Do not cook with or drink water from the hot water tap; lead dissolves more easily in hot water.
- *Do not boil water to remove lead.* Boiling water will not reduce lead levels.
- *Look for alternative sources or treatment of water.* If your lead result is above 15 ppb, you may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010, or www.nsf.org for information on performance standards for water filters.
- *Identify if your plumbing fixtures contain lead.* New faucets, fittings, and valves, may contain up to 8 percent lead including those advertised or labeled as "lead-free" and may contribute lead to drinking water. Consumers should be aware of this when choosing fixtures and take appropriate precautions.

Although the primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated soil, the U.S. EPA estimates that 10 to 20 percent of human exposure to lead may come from drinking water.

For more information, contact us at: _____

For more information on reducing lead exposure around your home and the health effects of lead, visit the U.S. EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Instructions for Completing Form

1. **WATER SUPPLY NAME:** Enter the name of the public water supply where sampling is being conducted.
2. **COUNTY:** Enter the name of the county in which the public water supply is located.
3. **WSSN:** Enter the 5-digit public water supply serial number (e.g., 01234 or 40123).
4. **POPULATION:** Enter the number of people served by the public water supply.
5. **MONITORING PERIOD:** Enter the beginning and end dates of the monitoring period during which the sampling took place (e.g., from 06/01/2009 to 09/30/2009).
6. **MINIMUM # OF SAMPLES REQUIRED:** This number is according to the rules based on population or set by the DEQ for lead/copper tap sampling for this public water supply.
7. **# OF SAMPLES TAKEN:** Indicate the number of tap samples taken for lead and copper analysis in the monitoring period.
8. **NAME OF CERTIFIED LABORATORY:** Enter the name of the certified laboratory performing the lead/copper analyses on samples taken in the monitoring period.
9. **SAMPLE CRITERIA:** Answer the questions accordingly, briefly explaining, where necessary, the reason for your action.
10. **NAME:** Enter the name, title, and phone of the authorized water utility official and date.
11. **TAP SAMPLING DATA:** Enter the name of the public water supply and the WSSN. Complete the remainder of the sheet as follows:

Sample Location: Enter the street address of the location where each lead and copper tap sample is taken.

Date: Enter the date the tap sample was collected.

Sample Category: Use the following numbers to designate the location criteria being met by the sample site:

	Sample Category	
Tier 1 Sites	1	Single family residence with lead service line.
	2	Single family residence with lead solder copper piping constructed after 1982.
	3	Single family residence with lead plumbing.
	4	Multiple family residence (MFR) with either lead service line, lead solder copper piping constructed after 1982, or lead plumbing (when MFR comprise at least 20 percent of the total service connections).
Tier 2 Sites	5	Buildings with lead service lines, lead solder copper piping constructed after 1982, or lead plumbing.
Tier 3 Sites	6	Single family residence with lead solder copper piping constructed before 1983.
Other		If no Tier 1, 2, or 3 sites available, sample sites that use plumbing materials commonly found at other locations in the water supply.

Additionally, if lead service lines are present, tap samples must be taken from the following:

50 percent from ...	AND 50 percent from ...
single family residences with lead service lines	single family residences with lead solder copper piping constructed after 1982 OR single family residences with lead plumbing.
Tier 1 sites should be selected for sampling over Tier 2 or 3 sites even if all samples are from lead service lines or from residences with lead solder copper piping constructed after 1982.	

Piping Materials: Designate the type of service line and building plumbing piping materials used at the location where the tap lead/copper sample was taken.

- C Copper
- G Galvanized
- L Lead
- P Plastic

Lead: Enter the concentration of lead in ppb (parts per billion) or $\mu\text{g/l}$ (micrograms per liter) as reported by the certified lab.

Copper: Enter the concentration of copper in ppb or $\mu\text{g/l}$ as reported by the certified lab.

Lab #: For lab purposes only, indicate a laboratory identification number or sample number

12. **CONSUMER NOTICE OF LEAD RESULT CERTIFICATION:** Water supplies have until 3 months after the end of the monitoring period to submit the certification along with a sample copy of a notice sent to consumers to the appropriate DEQ district office. For district office addresses, visit www.michigan.gov/deq and click on Contacts. However, the DEQ encourages water supplies to submit the certification (page 3) and the sample notice (template available on page 4) along with the Lead and Copper Report (pages 1 and 2 of this form), which is due within 10 days after the end of the monitoring period.



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Supervisor

Michael Prysby, District Engineer
Michigan Dept. of Environmental Quality
Constitution Hall, 4th Floor
525 W. Allegan St.
P.O. Box 30473
Lansing, MI 48909-7973

DEQ
RESOURCE MANAGEMENT DIVISION

July 10, 2012

JUL 16 2012

LANSING DISTRICT

RE: 2011 Lead & Copper Sampling

Mr. Prysby,

The last time we spoke you inquired about an issue with our 2011 lead and copper sampling. The issue involved two samples that were rejected by Detroit Waterworks Laboratory. The samples were rejected because the times between flushing & sampling were 5 ½ hours (less than 6 hours as specified). I inquired if they would test the samples in lieu of the time between flushing, but the laboratory emphatically refused. Samples were collected again from the same sample points, however the sampling occurred after October 1, 2011.

Sample bottles & instructions were originally distributed at the beginning of August 2011. It proved difficult to find willing participants, and it took numerous reminders to get most samples back in time. The samples were delivered to the Detroit laboratory as they were received. Eleven (11) samples were delivered on September 21, 2011 with the remaining 12 delivered on September 30, 2011. The two samples, which were rejected, were delivered on the 30th. The consumers were asked to resample and the samples were submitted to Detroit on October 24, 2011.

Included with this letter is some the information you requested when we last spoke. I have included a copy of the paperwork submitted to the laboratory with samples, and copies of the sampling instructions and required the information filled out by the consumers for the two samples that were rejected and the resamples. If there is anything else you require, please contact me anytime.

Mike Glasgow
City of Flint Water Plant WSSN: 2310
Laboratory & Water Quality Supervisor
(810) 787-6537 ext. 3512
Mglasgow@cityofflint.com

LEAD AND COPPER MONITORING

JUNE 1, 2011 THROUGH SEPTEMBER 30, 2011

IMPORTANT

DO NOT WRITE SITE CODES - THEY ARE IDENTIFIERS FOR THE ADDRESS

IF CUSTOMER DOES NOT WISH TO PARTICIPATE DRAW A LINE THROUGH THE ROW ON THE SHEET.

FOR EACH PROPERTY, WRITE THE ADDRESS WITH THE PROPERTY CODE AT THE END OF THE SHEET(S). DO NOT RE-USE SITE CODE NUMBERS.

PLEASE PROVIDE ALL INFORMATION THAT IS NEEDED ON THE SHEETS EXCEPT LABORATORY NUMBER.

SAMPLES ~~SHOULD~~ BE RETURNED TO THE WATER QUALITY LAB AT WATERWORKS PARK ~~FOR DELIVERY~~ COLLECTION. SAMPLES DO NOT REQUIRE REFRIGERATION.

SAMPLES SHOULD BE DELIVERED BETWEEN

11:30 a.m. AND 4:30 p.m. MONDAY - FRIDAY

Waterworks Park Water Treatment Plant Water Quality Lab

10100 E. Jefferson

Detroit, Michigan 48214

313 926-8127(28) or 313 926-8102

PLEASE PROVIDE THE FOLLOWING INFORMATION:

COMMUNITY NAME: CITY of FLINT

WSSN #: 2310

DATE: 9/21/11 9/30/11 10/24/2011

NUMBER OF SAMPLES Delivered: 11 12 2

NUMBER OF SAMPLES Required: 23 23 23

DELIVERED BY: Mike Glasgow Mike Glasgow Mike Glasgow

IF YOU WISH IT SHOULD BE SENT TO PLEASE PRINT

NAME: MIKE GLASGOW

ADDRESS: 4500 N. DORT HWY

CITY & ZIP CODE: FLINT 48505

PHONE NO.: (810) 787-6537

FAX NO.: (810) 787-3710

FOR LABORATORY USE ONLY:

Date Acidified: _____ By: _____

Lab # Sequence: _____ Analysis Laboratory (Check One) WWP

Date Sent to Laboratory: _____ Date Rcv'd results: _____

Date results sent to Community: _____ Date results sent to MDEQ: _____

10. TAP SAMPLING DATA: (Use additional sheets as needed)

System Name/County

Flint / Genesee

WSSN

2310

RESULTS:

Sample Location	Site Code	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
912 LaFayette	L 1		1	L	C			
2130 Flushing	L 2		1	L	C			
1614 Woodland Park	L 3		1	L	C			
919 Blanchard	L 4		1	L	G			
2322 Calumet	L 5		1	L	C			
2501 Bagley	L 6		1	L	G			
3704 Circle	L 7		1	L	C			
2110 N. Stevenson	L 8		1	L	G			
2201 Brownell	L 9		1	L	G			
2601 Mackin	L 10		1	L	G			
1201 Chippewa	L 11		1	L	G			
2613 Cassius	L 12		1	L	C			
502 Grapo	L 13		1	L	C			
2202 Joliet	L 14		1	L	G			
310 E. Foss	L 15		1	L	C			
3714 Circle	L 16		1	L	C			
4317 Pengelly	L 17		1	L	G			
2214 Nebraska	L 18		1	L	C			
2937 Oklahoma	L 19		1	L	C			

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 10, subparagraph "Sample Category".

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic

TO BE DETERMINED BY MDEQ

	90 th %ile	Ave	Max	Min	# > AL
Pb					
Cu					

10. TAP SAMPLING DATA: (Use additional sheets as needed)

System Name/County

Flint / Genesee

WSSN

2310

RESULTS:

Sample Location	Site Code	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
734 E. Foss	L 20		1	L	C			
530 Leta	L 21		1	L	C			
1922 Barth	L 22		1	L	G			
309 Marquette	L 23		1	L	C			
318 Marquette	L 24		1	L	G			
2428 Thomas	L 25		1	L	G			
2443 Thomas	L 26		1	L	C			
2448 Thomas	L 27		1	L	G			
2463 Thomas	L 28		1	L	G			
2472 Thomas	L 29		1	L	G			
2420 Norbert	L 30		1	L	G			
2448 Nolen	L 31		1	L	C			
611 Weller	L 32		1	L	C			
1613 Woodlawn Park	L 33		1	L	G			
238 Peer	L 34		1	L	C			
508 Avon	L 35		1	L	C			
352 Commonwealth	L 36		1	L	C			
2026 Hills	L 37		1	L	C			
2014 Leith	L 38		1	L	G			

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 10, subparagraph "Sample Category".

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic

TO BE DETERMINED BY MDEQ

	90 th %ile	Ave	Max	Min	# > AL
Pb					
Cu					

10. TAP SAMPLING DATA: (Use additional sheets as needed)

System Name/County

Flint / Genesee

WSSN

2310

RESULTS:

Sample Location	Site Code	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
1519 Lincoln Ave.	L 39		1	L	C			
1401 Maplewood	L 40		1	L	G			
509 Mathewson	L 41		1	L	L			
1805 Proctor	L 42		1	L	G			
2751 Swayze	L 43		1	L	L			
2467 Thomas	L 44		1	L	G			
2207 Windemere	L 45		1	L	G			
2701 Yale	L 46		1	L	C			
2705 Yale	L 47		1	L	C			
2709 Yale	L 48		1	L	C			
2710 Yale	L 49		1	L	C			
2713 Yale	L 50		1	L	C			
2714 Yale	L 51		1	L	C			
2717 Yale	L 52		1	L	C			
2718 Yale	L 53		1	L	C			
2724 Yale	L 54		1	L	C			
2734 Yale	L 55		1	L	C			
2801 Yale	L 56		1	L	C			
1701 Pennsylvania	L 57		1	L	G,C			

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 10, subparagraph "Sample Category".

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic

TO BE DETERMINED BY MDEQ

	90 th %ile	Ave	Max	Min	# > AL
Pb					
Cu					

10. TAP SAMPLING DATA: (Use additional sheets as needed)

System Name/County

Flint / Genesee

WSSN

2310

RESULTS:

Sample Location	Site Code	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2937 Oklahoma	L 58		1	L	C			
2465 Norbert	L 59		1	L	G,C			
2453 Norbert	L 60		1	L	G,C			
2471 Norbert	L 61		1	L	G,C			
2436 Norbert	L 62		1	L	G,C			
2459 Norbert	L 63		1	L	C			
2440 Norbert	L 64		1	L	C			
2470 Nolen Dr.	L 65		1	L	C			
3413 Brunswick Ave.	L 66	9/29/11	1	L	C			
416 Marquette	L 67		1	L	C			
2230 Winona	L 68		1	L	C			
2574 Nolen	L 69		1	L	C			
3744 Leith	L 70		1	L	C			
915 Hughes	L 71		1	L	C			
2706 Cumings	L 72		1	L	C			
1922 Bagley	L 73		1	L	C			
2014 Leith	L 74		1	L	C			
2111 Brownell Blvd.	L 75		1	L	C			
2459 Norbert	L 76		1	L	C			

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 10, subparagraph "Sample Category".

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic

TO BE DETERMINED BY MDEQ

	90 th %ile	Ave	Max	Min	# > AL
Pb					
Cu					

10. TAP SAMPLING DATA: (Use additional sheets as needed)

System Name/County

Flint / Genesee

WSSN 2310

RESULTS:

Sample Location	Site Code	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2619 Thomas	L 77		1	L	G			
2522 Wolcott	L 78		1	L	C			
3202 Camden	L 79		1	L	C			
313 E. Stewart	L 80		1	L	G			
2126 Nebraska	L 81		1	L	C			
206 Baker St.	L 82		1	L	C			
229 Baker St.	L 83		1	L	C			
911 Hughes	L 84		1	L	C			
422 W. Taylor	L 85							
1405 Maplewood	L 86							
2306 Levern	L 87		1	L	G/C			
1906 Knapman	L 88		1	L	C			
2310-610 Garland	L 89		1	L	G/C			
928 Garland	L 90		1	L	G/C			
5801 Edwards Ave.	L 91		1	L	C			
2436 Norbert	L 92		1	L	C			
3706 Leith	L 93		1	L	C			
911 Beard	L 94		1	L	G/C			
830 E. 7 th Street	L 95		1	L	G			

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 10, subparagraph "Sample Category".

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic

TO BE DETERMINED BY MDEQ

	90 th %ile	Ave	Max	Min	# > AL
Pb					
Cu					

10. TAP SAMPLING DATA: (Use additional sheets as needed)

System Name/County

Flint / Genesee

WSSN

2310

RESULTS:

Sample Location	Site Code	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
841 E. 7th Street	L 96		1	L	G			
849 E. 7th Street	L 97		1	L	G			
857 E. 7th Street	L 98		1	L	G			
903 E. 7th Street	L 99		1	L	G			
906 E. 7th Street	L 100		1	L	G			
909 E. 7th Street	L 101		1	L	G			
911 E. 7th Street	L 102		1	L	G			
915 E. 7th Street	L 103		1	L	G			
921 E. 7th Street	L 104		1	L	G			
924 E. 7th Street	L 105		1	L	C			
925 E. 7th Street	L 106		1	L	G			
932 E. 7th Street	L 107		1	L	G			
937 E. 7th Street	L 108		1	L	G			
942 E. 7th Street	L 109		1	L	G			
2424 Thomas	L 110		1	L	G			
2455 Thomas	L 111		1	L	G			
2402 Altoona	L 112		1	L	G			
2416 Altoona	L 113		1	L	G			
2512 Altoona	L 114		1	L	G			
2527 Altoona	L 115		1	L	C			

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 10, subparagraph "Sample Category".

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic

TO BE DETERMINED BY MDEQ

	90 th %ile	Ave	Max	Min	# > AL
Pb					
Cu					

10. TAP SAMPLING DATA: (Use additional sheets as needed)

System Name/County

Flint / Genesee

WSSN

2310

RESULTS:

Sample Location	Site Code	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2519 Norbert	L 116		1	L	G			
2534 Norbert	L 117		1	L	C			
2554 Norbert	L 118		1	L	C			
2559 Norbert	L 119		1	L	C			
2417 Thomas	L 120		1	L	G			
2451 Thomas	L 121		1	L	G			
1248 Niagra	L 122		1	L	G			
3713 Herrick St.	L 123		1	L	C, P			
1210 Campbell St.	L 124		1	L	C, P			
939 Alvord St.	L 125		1	L	C			
822 E. 6 th St.	L 126		1	L	C, P			
1100 Stockton St.	L 127		1	L	C, P			
2411 Illinois	L 128		1	L	C, P			
3119 Leith St.	L 129	9/12/11	1	L	C, P			
1422 Glarcy Ave.	L 130		1	L	C, P			
3022 Arizona	L 131		1	L	C			
413 Burroughs Ave.	L 132	9/14/11	1	L	P			
4205 Pengelly	L 133		1	L	C			
3521 Bennett	L 134	9/22/11	1	L	C, P			

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 10, subparagraph "Sample Category".

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic

TO BE DETERMINED BY MDEQ

	90 th %ile	Ave	Max	Min	# > AL
Pb					
Cu					

10. TAP SAMPLING DATA: (Use additional sheets as needed)

System Name/County

Flint / Genesee

WSSN

2310

RESULTS:

Sample Location	Site Code	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
2821 Hillcrest	L 135		1	L	C			
3722 Van Buren	L 136		1	L	G, P			
3009 Montana	L 137	9/21/11	1	L	L, C			
809 E. 3 rd Street	L 138		1	L	G			
3602 Camden	L 139		1	L	P			
722 McKinley	L 140		1	L	C			
4701 Forest Hill	L 141		1	L	L, P			
1505 Kensington	L 142	9/22/11	1	L	G			
2048 McPhail St	L 143		1	L	C			
605 Burroughs	L 144		1	L	G, C			
2922 Barth St.	L 145	9/19/11	1	L	C			
3107 Leith St.	L 146	9/16/11	1	L	C			
3120 Norwood	L 147	9/17/11	1	L	C, P			
111 Prospect	L 148		1	L	C, P			
617 Lyon Place	L 149		1	L	G, C			
2124 Wisconsin	L 150		1	L	G			
1020 Wellman	L 151		1	L	C			
3614 Branch	L 152		1	L	G, P			
1636 Blackberry Lane	L 153							

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 10, subparagraph "Sample Category".

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic

TO BE DETERMINED BY MDEQ

	90 th %ile	Ave	Max	Min	# > AL
Pb					
Cu					

10. TAP SAMPLING DATA: (Use additional sheets as needed)

System Name/County

Flint / Genesee

WSSN

2310

RESULTS:

Sample Location	Site Code	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
1914 Binbrook Lane	L 154	9/12/11	1	L	C/P			
306 S. Vernon Ave.	L 155		1	L	C			
3602 N. Term St.	L 156		1	L	C/P			
3405 Brunswick Ave.	L 157		1	L	C			
1801 Greenbriar Lane	L 158		1	L	C			
2762 Yale	L 159		1	L	C			
811 Oak St.	L 160		1	L	G			
616 Carrill Ct. #2	L 161		1	L	C			
1651 Woodlawn Park Dr.	L 162	9/12/11	1	L	G			
5440 Edwards Ave.	L 163		1	L	C			
710 Leland St.	L 164		1	L	C			
638 W. Pulaski Ave.	L 165		1	L	C			
1223 Campbell St.	L 166		1	L	G			
1017 Simcoe Ave.	L 167		1	L	C			
1537 Lincoln	L 168		1	L	G			
3314 Gratiot Ave.	L 169		1	L	C			
3320 Leith St.	L 170		1	L	C/P			
3227 Raskob	L 171		1	L	C/P			

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 10, subparagraph "Sample Category".

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic

TO BE DETERMINED BY MDEQ

	90 th %ile	Ave	Max	Min	# > AL
Pb					
Cu					

10. TAP SAMPLING DATA: (Use additional sheets as needed)

System Name/County

Flint / Genesee

WSSN

2310

RESULTS:

Sample Location	Site Code	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
305 ALLENDALE	L 172	9/15/11	1	L	C, P			
415 W. 4 th AVE.	L 173	9/14/11	1	L	C, P			
2625 PINETREE DR.	L 174	9/13/11	1	L	C			
3205 CHEYENNE AVE	L 175	9/13/11	1	L	C, P			
1809 E. COURT ST.	L 176	9/29/11	1	L	C, P			
3821 DELAWARE AVE	L 177	9/28/11	1	L	C, P			
3517 BENNETT AVE	L 178	9/27/11	1	L	C, P			
2617 PROSPECT ST.	L 179	9/29/11	1	L	C, P			
3814 DELAWARE AVE	L 180	9/27/11	1	L	P			
3005 MONTANA AVE	L 181	9/20/11	1	L	C, P			
2648 SWATZE ST	L 182	9/27/11	1	L	C, P			
3805 LARCHMONT ST.	L 183	9/29/11	1	L	C, P			
3517 BENNETT	L 178	10/12/11	1	L	C, P			
3805 LARCHMONT	L 183	10/18/11	1	L	C, P			
	L		1	L				
	L		1	L				
	L		1	L				
	L		1	L				
	L		1	L				

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 10, subparagraph "Sample Category".

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic

TO BE DETERMINED BY MDEQ

	90 th %ile	Ave	Max	Min	# > AL
Pb					
Cu					

Drinking Water Lead & Copper Sampling Instructions

Dear Resident:

Thank you for helping to monitor for lead and copper in the drinking water.

To get an accurate measurement of the lead or copper in the water, please collect your sample after the water has sat idle for 6 to 8 hours. DO NOT sample from a faucet that has not been used for an extended period of time such as a basement sink, guest bath or garden hose tap. DO NOT use taps that are connected to water softeners or point-of-use treatment devices.

1. The night before you collect the sample, turn on the COLD faucet of your kitchen or main bathroom sink and let it run for 3 to 4 minutes. If you have a single handle faucet, turn it to the COLD side.
2. Do not use the water for 6 to 8 hours.
3. In the morning, fill the sample bottle to the neck with the "first draw" of COLD water from the faucet that you flushed the previous night.
4. Please answer the following questions:

Did you run the water for 3 to 4 minutes the night before you filled the bottle? ☒ Yes ☐ No

What date and time in the evening did you run the water? Date 9/29 Time 8:00 P.M. PM

What date and time in the morning did you fill the bottle? Date 9/29 Time 1:30 A.M. AM

Did you fill the bottle from the faucet you flushed the night before? ☒ Yes ☐ No

If No, please explain: _____

Which faucet did you use to fill the bottle? ☒ Kitchen ☐ Main Bathroom ☐ Other

If Other, please describe: _____

Your Printed Name DANIEL SULLIVAN

Your Address 3805 WILLOW ST

Your Signature Daniel Sullivan

5. Attach this form to the bottle and leave it outside your front door for pick-up.

If you have any questions call:

Water Supply: _____

Manager or
Water Operator: _____

Phone: _____

Or contact:

Michigan Department of Environmental Quality

DEQ contact: _____

Phone: _____

Thanks again for your help. Information on this year's lead and copper monitoring will be printed in the *Consumer Confidence Report* that will be made available to you by July 1 of next year.

2178 Drinking WaterLead & Copper Sampling Instructions

Dear Resident:

Thank you for helping to monitor for lead and copper in the drinking water.

To get an accurate measurement of the lead or copper in the water, please collect your sample after the water has sat idle for 6 to 8 hours. DO NOT sample from a faucet that has not been used for an extended period of time such as a basement sink, guest bath or garden hose tap. DO NOT use taps that are connected to water softeners or point-of-use treatment devices.

1. The night before you collect the sample, turn on the COLD faucet of your kitchen or main bathroom sink and let it run for 3 to 4 minutes. If you have a single handle faucet, turn it to the COLD side.
2. Do not use the water for 6 to 8 hours.
3. In the morning, fill the sample bottle to the neck with the "first draw" of COLD water from the faucet that you flushed the previous night.
4. Please answer the following questions:

Did you run the water for 3 to 4 minutes the night before you filled the bottle? ☒ Yes ☐ No

What date and time in the evening did you run the water? Date 7/27/11 Time 3:07 PM

What date and time in the morning did you fill the bottle? Date 7/27/11 Time 8:30 A.M.

Did you fill the bottle from the faucet you flushed the night before? ☒ Yes ☐ No

If No, please explain: _____

Which faucet did you use to fill the bottle? ☒ Kitchen ☐ Main Bathroom ☐ Other

If Other, please describe: _____

Your Printed Name Randy Freeman

Your Address 3517 Bennett

Your Signature Randy Freeman

5. Attach this form to the bottle and leave it outside your front door for pick-up.

If you have any questions call:

Water Supply: CITY OF FLINT

Manager or Water Operator: MIKE GUSGOW

Phone: (810) 787-6537 ext. 3512

Or contact:

Michigan Department of Environmental Quality

DEQ contact: _____

Phone: _____

Thanks again for your help. Information on this year's lead and copper monitoring will be printed in the *Consumer Confidence Report* that will be made available to you by July 1 of next year.

Drinking Water Lead & Copper Sampling Instructions

Dear Resident:

Thank you for helping to monitor for lead and copper in the drinking water.

To get an accurate measurement of the lead or copper in the water, please collect your sample after the water has sat idle for 6 to 8 hours. DO NOT sample from a faucet that has not been used for an extended period of time such as a basement sink, guest bath or garden hose tap. DO NOT use taps that are connected to water softeners or point-of-use treatment devices.

1. The night before you collect the sample, turn on the COLD faucet of your kitchen or main bathroom sink and let it run for 3 to 4 minutes. If you have a single handle faucet, turn it to the COLD side.
2. Do not use the water for 6 to 8 hours.
3. In the morning, fill the sample bottle to the neck with the "first draw" of COLD water from the faucet that you flushed the previous night.
4. Please answer the following questions:

Did you run the water for 3 to 4 minutes the night before you filled the bottle? ☒ Yes ☐ No

What date and time in the evening did you run the water? Date 10/17 Time 7:30 P.M.

What date and time in the morning did you fill the bottle? Date 10/17 Time 2:00 A.M.

Did you fill the bottle from the faucet you flushed the night before? ☒ Yes ☐ No

If No, please explain: _____

Which faucet did you use to fill the bottle? ☒ Kitchen ☐ Main Bathroom ☐ Other

If Other, please describe: _____

Your Printed Name DOLLIE SULLIVAN

Your Address 3805 LARCHMONT ST

FLINT, MI 48532

Your Signature Dollie Sullivan

5. Attach this form to the bottle and leave it outside your front door for pick-up.

If you have any questions call:

Water Supply: CITY OF FLINT

Manager or
Water Operator: MIKE GLASGOW

Phone: (810) 787-6537 ext. 354

Or contact:

Michigan Department of Environmental Quality

DEQ contact: _____

Phone: _____

Thanks again for your help. Information on this year's lead and copper monitoring will be printed in the *Consumer Confidence Report* that will be made available to you by July 1 of next year.

Drinking Water Lead & Copper Sampling Instructions

L 178

Dear Resident:

Thank you for helping to monitor for lead and copper in the drinking water.

To get an accurate measurement of the lead or copper in the water, please collect your sample after the water has sat idle for 6 to 8 hours. DO NOT sample from a faucet that has not been used for an extended period of time such as a basement sink, guest bath or garden hose tap. DO NOT use taps that are connected to water softeners or point-of-use treatment devices.

1. The night before you collect the sample, turn on the COLD faucet of your kitchen or main bathroom sink and let it run for 3 to 4 minutes. If you have a single handle faucet, turn it to the COLD side.
2. Do not use the water for 6 to 8 hours.
3. In the morning, fill the sample bottle to the neck with the "first draw" of COLD water from the faucet that you flushed the previous night.
4. Please answer the following questions:

Did you run the water for 3 to 4 minutes the night before you filled the bottle? ☒ Yes ☐ No

What date and time in the evening did you run the water? Date 10-17 Time 11 P.M.

What date and time in the morning did you fill the bottle? Date 10-18 Time 7 A.M.

Did you fill the bottle from the faucet you flushed the night before? ☒ Yes ☐ No

If No, please explain: _____

Which faucet did you use to fill the bottle? ☒ Kitchen ☐ Main Bathroom ☐ Other

If Other, please describe: _____

Your Printed Name Randy Fitzgerald

Your Address 3517 BOWEN ST

FLINT

Your Signature Randy Fitzgerald

5. Attach this form to the bottle and leave it outside your front door for pick-up.

If you have any questions call:

Water Supply: CITY OF FLINT

Manager or Water Operator: MIKE GLASCO

Phone: (810) 787-6537 ext. 3542

Or contact:

Michigan Department of Environmental Quality

DEQ contact: _____

Phone: _____

Thanks again for your help. Information on this year's lead and copper monitoring will be printed in the *Consumer Confidence Report* that will be made available to you by July 1 of next year.



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities

DEQ
RESOURCE MANAGEMENT DIVISION

DEC 19 2011
LANSING DISTRICT



Brent Wright
Water Plant Supervisor

December 14, 2011

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

Mr. Rosenthal,

Enclosed you will find the results of our 2011 Lead & Copper monitoring for the City of Flint Water Plant (WSSN 2310). Also included are the Consumer Notice Certification, and a copy of a Consumer Notice of Lead Result I have also included copies of the correspondence associated with the lead & copper testing. If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint.com

CITY OF DETROIT
WATER AND SEWERAGE DEPARTMENT
WATER QUALITY DIVISION

10100 EAST JEFFERSON AVENUE
DETROIT, MICHIGAN 48214
PHONE 313•926•8102/926•8127 TTY: 311
FAX 313•926•8120
WWW.DETROITMI.GOV

September 20, 2011

Flint Water Department
Mr. Mike Glasgow
4500 Dort Highway
Flint, MI 48505

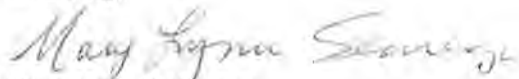
Dear Mr. Glasgow:

Enclosed you will find a copy of your lead and copper results and a copy of the lead and copper report certificate for 2011. A copy of your community's results and the Lead and Copper Report Certificate were sent to Jeff Antil at the Michigan Department of Environmental Quality (MDEQ), Jackson State Office Building, 301 East Louis Glick Highway Jackson, MI 48901. If you should have any questions concerning your community's lead and copper results please contact Mary Lynn Semegen, 313.926.8102 or Patrick Williford, 313.926.8127.

The **Short - term Revised** Lead and Copper Rule requires each Community Water Supply (CWS) deliver a Consumer Notice Of Lead Result to occupants of each location sampled within **30 days** of knowing of the sample results. The CWS must also mail a **sample copy** of the Consumer Notice Of Lead Result to the DEQ along with the Certification the Notice has been Distributed no later than **3 months** following the end of the monitoring period. If you should have any questions about the requirements for the Lead and Copper Rule please contact Jeff Antil, 517.780.7840 or your District Engineer.

Templates of the required forms can be found on the Michigan DEQ website michigan.gov/deq

Sincerely,



Mary Lynn Semegen
Detroit Water and Sewerage Department
Water Quality Division, Manager II

Detroit Water & Sewerage Department
Water Quality Laboratory
10100 East Jefferson Avenue
Detroit, MI 48214
(313) 926-8128 Laboratory
(313) 926-8127 Office

FAX

Facsimile Transmittal

FAX NO: ~~313.926.8120~~
313.042.6418

Date: 11/15/2011 2 pages, including this one

FROM: Patrick Williford (313.926.8127)

TO: Mike Glasgow FAX NO: 800.787.3710

RE: LCR results for Flint

COMMENTS: L178 and L183 were analyzed. I also sent an email to Jeff Antil with MDEQ with the results.

Drinking Water Lead & Copper Report & Certificate



1. System Name: Flint 2. WSSN: **2310**
 1a. County: Genesee
 3. Population: 102,434 4. Monitoring Period: From: 6/2011 To: 9/2011
 5. Minimum # of Samples Required: 23 6. # of Samples Taken: 11 of 23
 7. Name of Certified Laboratory: DWSD - Water Quality Laboratory 12 of 23
 8. SAMPLE CRITERIA: 2 samples

Yes	No	
☐	☒	a. Are the same sampling points used as in the previous monitoring period?
☐	☒	b. Are all samples from Tier 1 sites?
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the water system?
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?

For more information see Instructions paragraph 10, subparagraph "Sample Category".

Comments: NEW SITES USED DUE TO VACANT HOMES, + UNWILLING CUSTOMER PARTICIPATION.

9. CERTIFICATION:

I hereby certify that to the best of my knowledge, all tap samples were collected in the manner specified by EPA lead/copper regulations (i.e., one liter first draw samples following at least six hours of stagnation and that where necessary, proper instructions were given for homeowner collection).

Signature: <u>Michael Flanagan</u>	Phone: <u>(810) 787-6537</u>
Title: <u>LABORATORY + WATER QUALITY SUPERVISOR</u>	Date: <u>9/21/11</u>

Michael Flanagan 9/30/11
Michael Flanagan 10/24/11

10. TAP SAMPLING DATA: (Use additional sheets as needed)

System Name/County

Flint / Genesee

WSSN

2310

RESULTS:

Sample Location	Site Code	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumbing ²	Lead (ppb)	Copper (ppb)	Lab #
3413 Brunswick Ave.	L 66	09/25/2011	1	L	C	< 2.0	< 5.0	2310-066
3119 Leith St.	L 129	09/12/2011	1	L	C, P	< 2.0	31.8	2310-129
413 Burroughs Ave.	L 132	09/14/2011	1	L	P	< 2.0	31.8	2310-132
3521 Bennett	L 134	09/22/2011	1	L	C, P	< 2.0	17.5	2310-134
3009 Montana	L 137	09/21/2011	1	L	L, C	< 2.0	< 5.0	2310-137
1505 Kensington	L 142	09/27/2011	1	L	G	< 2.0	< 5.0	2310-142
2922 Barth St.	L 145	09/19/2011	1	L	C	< 2.0	21.5	2310-145
3107 Leith St.	L 146	09/16/2011	1	L	C	< 2.0	211.0	2310-146
3120 Norwood	L 147	09/17/2011	1	L	C, P	< 2.0	28.6	2310-147
1914 Penbrook	L 154	09/12/2011	1	L	C/P	< 2.0	48.1	2310-154
1651 Woodlawn Park Dr.	L 162	09/12/2011	1	L	G	< 2.0	102.0	2310-162
305 Allendale	L 172	09/15/2011	1	L	C/P	< 2.0	27.4	2310-172
415 W. 4 th Ave.	L 173	09/14/2011	1	L	C/P	< 2.0	24.2	2310-173
2625 Pinetree Dr.	L 174	09/13/2011	1	L	C	< 2.0	112.0	2310-174
3205 Cheyenne Ave	L 175	09/13/2011	1	L	C/P	< 2.0	25.0	2310-175
1809 E. Court Street	L 176	09/29/2011	1	L	C,P	< 2.0	< 5.0	2310-176
3821 Delaware	L 177	09/28/2011	1	L	C,P	< 2.0	< 5.0	2310-177
3517 Bennett	L 178	10/18/2011				< 2.0	20.2	2310-178
2617 Prospect Street	L 179	09/29/2011	1	L	C,P	< 2.0	47.0	2310-179
3814 Delaware Ave.	L 180	09/27/2011	1	L	P	< 2.0	23.4	2310-180
3005 Montana Ave.	L 181	09/20/2011	1	L	C,P	< 2.0	11.3	2310-181
2648 Swayze	L 182	09/27/2011	1	L	C,P	< 2.0	34.3	2310-182
3805 Larchmont	L 183	10/17/2011				< 2.0	58.0	2310-183

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 10, subparagraph "Sample Category".

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic

TO BE DETERMINED BY MDEQ

	90 th %ile	Ave	Max	Min	# > AL
Cu					

12. CONSUMER NOTICE OF LEAD RESULT CERTIFICATION: Each Community Water Supply (CWS) must deliver a consumer notice of lead result to occupants of each location sampled within 30 days of knowing the sample result under 40 CFR §141.85 of the Lead and Copper Rule Short Term Regulatory Revisions and Clarifications. A template of the notice is available on the next page.

Not later than 3 months following the end of the monitoring period, each CWS must mail a sample copy of the consumer notice of lead result to the DEQ along with a certification that the notice has been distributed under 40 CFR §141.91(f)(3). This sheet (page 3) may be used to meet the certification requirement. Submit this certification sheet along with a sample copy of a notice sent to consumers to the appropriate DEQ district office. For district office addresses, visit www.michigan.gov/deq and click on Contacts.

I certify that this public water supply has provided the consumer notice of lead result to persons served at each of the taps that was tested, either by mail or by another method approved by the DEQ, within 30 days of knowing the result. Attached is a sample of the notice I sent to consumers. It includes:

- The result of lead tap water monitoring for the tap that was tested.
- An explanation of the health effects of lead.
- Steps consumers can take to reduce exposure to lead in drinking water.
- Contact information for the public water supply.
- The maximum contaminant level goal and the action level for lead and the definitions for these two terms.

Water Supply Name:

CITY OF FLINT

County:

GENESSEE

WSSN: 2310

Signature:

Michael Glasgow

Printed Name:

MICHAEL GLASGOW

Title: LABORATORY + WATER QUALITY

Phone: (810) 787-6537

Date: 11/23/11

SUPERVISOR

Consumer Notice of Lead Result in Drinking Water

Water Supply Name:

CITY OF FLINT

County:

GENESEE

WSSN:

2310

Sample Location:

2922 BARTH ST.

Date Sampled:

9/19/2011

Thank you for participating in the lead and copper monitoring of drinking water. The levels of lead and copper found at your location are in the table below.

Key to Table	Contaminant	AL	MCLG	Your Result
<u>Action Level (AL):</u> The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. <u>Maximum Contaminant Level Goal (MCLG):</u> The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. <u>ppb:</u> parts per billion or micrograms per liter.	Lead (ppb)	15	0	< 2.0
	Copper (ppb)	1300	1300	21.5

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and it can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

To reduce exposure to lead in drinking water:

- *Run your water to flush out lead.* Run the water until it becomes cold.
- *Use cold water for cooking and preparing baby formula.* Do not cook with or drink water from the hot water tap; lead dissolves more easily in hot water.
- *Do not boil water to remove lead.* Boiling water will not reduce lead levels.
- *Look for alternative sources or treatment of water.* If your lead result is above 15 ppb, you may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010, or www.nsf.org for information on performance standards for water filters.
- *Identify if your plumbing fixtures contain lead.* New faucets, fittings, and valves, may contain up to 8 percent lead including those advertised or labeled as "lead-free" and may contribute lead to drinking water. Consumers should be aware of this when choosing fixtures and take appropriate precautions.

Although the primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated soil, the U.S. EPA estimates that 10 to 20 percent of human exposure to lead may come from drinking water.

For more information, contact us at:

(810) 787-6537

For more information on reducing lead exposure around your home and the health effects of lead, visit the U.S. EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Drinking Water Lead & Copper Report & Certificate



1. System Name: Flint 2. WSSN: **2310**
 1a. County: Genesee
 3. Population: 102,434 4. Monitoring Period: From: 6/2011 To: 9/2011
 5. Minimum # of Samples Required: 23 6. # of Samples Taken: 11 & 23
 7. Name of Certified Laboratory: DWSD - Water Quality Laboratory

8. SAMPLE CRITERIA:

Yes	No	
☐	☒	a. Are the same sampling points used as in the previous monitoring period?
☐	☒	b. Are all samples from Tier 1 sites?
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the water system?
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?

For more information see Instructions paragraph 10, subparagraph "Sample Category".

Comments: NEW ADDRESSES WERE USED, DUE TO VACANT HOMES
& UNWILLING CUSTOMER PARTICIPATION *AR*

9. CERTIFICATION:

I hereby certify that to the best of my knowledge, all tap samples were collected in the manner specified by EPA lead/copper regulations (i.e., one liter first draw samples following at least six hours of stagnation and that where necessary, proper instructions were given for homeowner collection).

Signature <u>Michael Glasgow</u>	Phone: <u>(810) 787-6537</u>
Title: <u>LABORATORY & WATER QUALITY SUPERVISOR</u>	Date: <u>9/21/11</u>

21 10/19/11
AR

10. TAP SAMPLING DATA: (Use additional sheets as needed)

System Name/County

Flint / Genesee

WSSN

2310

RESULTS:

Sample Location	Site Code	Sample Date	Sample Category ¹	Service Lines ²	Bldg Plumb-ing ²	Lead (ppb)	Copper (ppb)	Lab #
3413 Brunswick Ave.	L 66	09/25/2011	1	L	C	<2.0	<5.0	2310-066
3119 Leith St.	L 129	09/12/2011	1	L	C, P	<2.0	31.8	2310-129
413 Burroughs Ave.	L 132	09/14/2011	1	L	P	<2.0	31.8	2310-132
3521 Bennett	L 134	09/22/2011	1	L	C, P	<2.0	17.5	2310-134
3009 Montana	L 137	09/21/2011	1	L	L, C	<2.0	<5.0	2310-137
1505 Kensington	L 142	09/27/2011	1	L	G	<2.0	<5.0	2310-142
2922 Barth St.	L 145	09/19/2011	1	L	C	<2.0	21.5	2310-145
3107 Leith St.	L 146	09/16/2011	1	L	C	<2.0	211.0	2310-146
3120 Norwood	L 147	09/17/2011	1	L	C, P	<2.0	28.6	2310-147
1914 Penbrook	L 154	09/12/2011	1	L	C/P	<2.0	48.1	2310-154
1651 Woodlawn Park Dr.	L 162	09/12/2011	1	L	G	<2.0	102.0	2310-162
305 Allendale	L 172	09/15/2011	1	L	C/P	<2.0	27.4	2310-172
415 W. 4 th Ave.	L 173	09/14/2011	1	L	C/P	<2.0	24.2	2310-173
2625 Pinetree Dr.	L 174	09/13/2011	1	L	C	<2.0	112.0	2310-174
3205 Cheyenne Ave	L 175	09/13/2011	1	L	C/P	<2.0	25.0	2310-175
1809 E. Court Street	L 176	09/29/2011	1	L	C,P	<2.0	<5.0	2310-176
3821 Delaware	L 177	09/28/2011	1	L	C,P	<2.0	<5.0	2310-177
2617 Prospect Street	L 179	09/29/2011	1	L	C,P	<2.0	47.0	2310-179
3814 Delaware Ave	L 180	09/27/2011	1	L	P	<2.0	23.4	2310-180
3005 Montana Ave.	L 181	09/20/2011	1	L	C,P	<2.0	11.3	2310-181
2648 Swayze	L 182	09/27/2011	1	L	C,P	<2.0	34.3	2310-182

¹ Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 10, subparagraph "Sample Category".

² Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic

TO BE DETERMINED BY MDEQ

	90 th %ile	Ave	Max	Min	# > AL
	0				0
Cu	96.6				0



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Water Plant Supervisor

July 2, 2015

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

DEQ
RESOURCE MANAGEMENT DIVISION

JUL 08 2015

LANSING DISTRICT

Mr. Adam Rosenthal,

Enclosed are the results from our 2015 2nd quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint



Water Quality Monitoring
2nd Quarter 2015

SAMPLE POINT IDENTIFICATION				PARAMETERS AND RESULTS				
Distribution System Location #	Sample Point Name & Address	Sample Date	Time	Temperature (C)	Conductivity (mS)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Calcium (mg/L Ca ²⁺)
#1	Arby's 3742 Davison Rd.	5/14/2015	10:17	15.1	0.475	7.53	62	62.5
#2	BP Gas Station 822 S.Dort Hwy	5/14/2015	13:32	14.7	0.471	7.51	56	60.9
#3	Liquor Palace 3302 S. Dort Hwy	5/14/2015	10:51	16.2	0.470	7.49	60	63.3
#4	Taco Bell 3606 Corunna Rd.	5/14/2015	11:25	15.2	0.471	7.52	58	61.7
#5	University Market 2501 Flushing Rd.	5/14/2015	11:42	16.5	0.480	7.48	61	64.1
#6	Salem Housing 3216 MLK Blvd.	5/14/2015	12:04	13.9	0.490	7.58	68	64.9
#7	Rite-Aid 5018 Clio Rd.	5/14/2015	12:25	11.9	0.485	7.52	64	65.7
#8	N. Flint Automotive 6204 N. Saginaw St.	5/14/2015	12:44	17.6	0.460	7.52	47	61.7
CS	Cedar Street Reservoir & Pump Station	5/12/2015	9:28	14.1	0.470	7.80	76	56.1
WS	West Side Reservoir & Pump Station	5/13/2015	10:22	17.1	0.497	7.59	70	67.3
N/A	Russell Collection Agency 3285 Van Slyke Rd	6/22/2015	12:06	19.1	0.512	7.61	77	69.7
N/A	Southwestern Academy High School 1420 W.12th St.	6/17/2015	11:14	22.3	0.523	7.66	84	70.5
N/A	Cummings Elementary School G-2200 Walton St.	6/17/2015	11:28	18.8	0.508	7.66	80	68.1
N/A	Rite-Aid 3521 Corunna Rd.	6/17/2015	11:35	19.3	0.536	7.79	92	74.5
N/A	Clio Rd. Pharmacy 4902 Clio Rd.	6/22/2015	12:30	21.4	0.498	7.69	84	66.5
N/A	Tim Hortons 1274 Ballanger Hwy.	6/17/2015	11:54	18.9	0.540	7.68	90	72.9
N/A	Arby's 3559 S. Dort Hwy.	6/15/2015	13:07	22.4	0.504	7.73	82	65.7
N/A	Ya Ya's 519 S. Dort Hwy	6/15/2015	13:17	20.4	0.506	7.70	82	68.9
N/A	Taco Bell 1740 S. Dort Hwy	6/15/2015	12:57	20.2	0.485	7.62	74	60.9
N/A	Grandma's Recipe 3538 Richfield Rd.	6/15/2015	10:27	19.3	0.496	7.61	76	64.1
N/A	Flint City Hall 1101 S. Saginaw St.	5/13/2015	10:00	18.5	0.484	7.69	68	64.9
N/A	Quizzno's 3818 E. Court St.	6/15/2015	12:45	23.6	0.495	7.73	76	64.9
N/A	Whitehorse Tavern 621 W. Court St.	6/17/2015	10:49	21.2	0.526	7.67	84	72.1
N/A	Flint Public Library 1026 E. Kearsley Rd.	6/23/2015	13:21	18.6	0.494	7.73	81	65.7
N/A	Rite-Aid 3717 Fenton Rd.	5/12/2015	9:10	17.6	0.506	7.67	80	68.9



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Water Plant Supervisor

March 24, 2015

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

Mr. Adam Rosenthal,

Enclosed are the results from our 2015 1st quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

DEQ
RESOURCE MANAGEMENT DIVISION

MAR 30 2015

CAMPBELL DISTRICT

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint



Water Quality Monitoring
1st Quarter 2014

DEQ
WATER QUALITY DIVISION

MAR 20 2015

SAMPLE POINT IDENTIFICATION				PARAMETERS AND RESULTS				
Distribution System Location #	Sample Point Name & Address	Sample Date	Time	Temperature (C)	Conductivity (mS)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Calcium (mg/L Ca ²⁺)
#1	Arby's 3742 Davison Rd.	3/4/2015	10:11	6.5	0.594	7.65	119	70.5
#2	BP Gas Station 822 S.Dort Hwy	3/4/2015	10:34	3.6	0.594	7.77	128	71.3
#3	Liquor Palace 3302 S. Dort Hwy	3/4/2015	10:51	8.7	0.604	7.83	130	70.5
#4	Taco Bell 3606 Corunna Rd.	3/4/2015	11:13	4.8	0.607	7.87	128	72.1
#5	University Market 2501 Flushing Rd.	3/4/2015	11:28	3.5	0.618	7.85	124	75.4
#6	Salem Housing 3216 MLK Blvd.	3/4/2015	12:31	10.3	0.573	7.95	116	65.7
#7	Rite-Aid 5018 Clio Rd.	3/4/2015	12:46	8.1	0.602	7.93	128	77.0
#8	N. Flint Automotive 6204 N. Saginaw St.	3/4/2015	13:05	12.8	0.584	7.84	132	73.7
CS	Cedar Street Reservoir & Pump Station	3/17/2015	10:45	7.8	0.570	7.86	114	73.7
WS	West Side Reservoir & Pump Station	3/4/2015	11:49	1.9	0.609	7.86	120	77.8
N/A	Russell Collection Agency 3285 Van Slyke Rd	3/6/2015	9:49	6.4	0.540	7.69	110	81.0
N/A	Southwestern Academy High School 1420 W. 12th St.	3/11/2015	11:08	19.7	0.630	7.99	128	80.2
N/A	Cummings Elementary School G-2200 Walton St.	3/11/2015	11:23	7.1	0.569	7.81	128	83.4
N/A	Rite-Aid 3521 Corunna Rd.	3/10/2015	11:10	8.4	0.596	7.88	130	78.6
N/A	Clio Rd. Pharmacy 4902 Clio Rd.	3/5/2015	11:55	7.7	0.611	7.80	128	85.6
N/A	Tim Hortons 1274 Ballanger Hwy.	3/5/2015	11:06	5.3	0.620	7.76	124	82.6
N/A	Arby's 3559 S. Dort Hwy.	3/5/2015	10:36	11.0	0.629	7.80	130	83.4
N/A	Ya Ya's 519 S. Dort Hwy	3/13/2015	10:31	14.8	0.603	7.77	134	84.2
N/A	Taco Bell 1740 S. Dort Hwy	3/13/2015	10:41	4.7	0.586	7.77	134	84.2
N/A	Grandma's Recipe 3538 Richfield Rd.	3/5/2015	9:45	6.5	0.580	7.73	130	84.2
N/A	Flint City Hall 1101 S. Saginaw St.	3/6/2015	10:33	14.1	0.630	7.71	136	83.4
N/A	Quizzno's 3818 E. Court St.	3/12/2015	11:03	7.9	0.572	7.93	122	87.4
N/A	Whitehorse Tavern 621 W. Court St.	3/6/2015	10:12	9.1	0.634	7.60	134	84.2
N/A	Flint Public Library 1026 E. Kearsley Rd.	3/6/2015	10:56	20.7	0.606	7.85	126	81.8
N/A	Rite-Aid 3717 Fenton Rd.	3/10/2015	10:53	9.6	0.623	7.84	126	75.4



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Water Plant Supervisor

December 21, 2014

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

DEQ
RESOURCE MANAGEMENT DIVISION

JAN 08 2015

LANSING DISTRICT

Mr. Adam Rosenthal,

Enclosed are the results from our 2014 4th quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint



Water Quality Monitoring

4th Quarter 2014

SAMPLE POINT IDENTIFICATION				PARAMETERS AND RESULTS				
Distribution System Location #	Sample Point Name & Address	Sample Date	Time	Temperature (C)	Conductivity (mS)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Calcium (mg/L Ca ²⁺)
#1	Arby's 3742 Davison Rd.	11/25/2014	10:40	16.8	0.465	7.96	114	58.5
#2	BP Gas Station 822 S. Dort Hwy	11/25/2014	10:53	14.9	0.421	7.99	114	60.9
#3	Liquor Palace 3302 S. Dort Hwy	11/25/2014	11:08	11.6	0.461	7.98	118	59.3
#4	Taco Bell 3606 Corunna Rd.	11/25/2014	11:49	17.4	0.479	7.99	118	60.1
#5	University Market 2501 Flushing Rd.	11/25/2014	12:08	15.6	0.442	7.90	116	63.3
#6	Salem Housing 3216 MLK Blvd.	11/25/2014	12:34	15.0	0.437	7.85	104	58.5
#7	Rite-Aid 5018 Clio Rd.	11/25/2014	13:00	16.1	0.448	7.99	118	62.5
#8	N. Flint Automotive 6204 N. Saginaw St.	11/25/2014	13:14	16.1	0.488	8.00	114	59.3
CS	Cedar Street Reservoir & Pump Station	11/25/2014	11:25	11.1	0.442	7.99	108	60.9
WS	West Side Reservoir & Pump Station	11/25/2014	12:18	9.1	0.449	7.96	114	59.3
N/A	Russell Collection Agency 3285 Van Slyke Rd	12/2/2014	11:35	12.2	0.372	7.67	100	64.1
N/A	Southwestern Academy High School 1420 W. 12th St.	12/2/2014	11:23	12.7	0.352	7.71	100	65.7
N/A	Cummings Elementary School G-2200 Walton St.	12/2/2014	11:51	11.2	0.382	7.65	108	64.1
N/A	Rite-Aid 3521 Corunna Rd.	11/28/2014	12:37	13.2	0.405	8.03	106	55.3
N/A	Clio Rd. Pharmacy 4902 Clio Rd.	12/2/2014	13:00	13.4	0.356	7.62	100	65.7
N/A	Tim Hortons 1274 Ballanger Hwy.	11/28/2014	12:58	11.7	0.404	7.95	106	50.5
N/A	Arby's 3559 S. Dort Hwy.	11/26/2014	11:07	15.5	0.443	7.87	108	68.1
N/A	Ya Ya's 519 S. Dort Hwy	11/26/2014	10:33	12.2	0.424	7.95	106	66.5
N/A	Taco Bell 1740 S. Dort Hwy	11/26/2014	10:50	9.5	0.414	7.86	108	64.1
N/A	Grandma's Recipe 3538 Richfield Rd.	11/26/2014	9:55	15.3	0.426	7.68	114	65.7
N/A	Flint City Hall 1101 S. Saginaw St.	12/3/2014	10:00	15.7	0.404	7.84	98	61.7
N/A	Quizzno's 3818 E. Court St.	11/26/2014	10:19	11.5	0.421	7.88	122	68.1
N/A	Whitehorse Tavern 621 W. Court St.	11/28/2014	12:00	12.0	0.405	8.10	104	56.9
N/A	Flint Public Library 1026 E. Kearsley Rd.	12/3/2014	11:00	18.4	0.449	7.76	100	59.3
N/A	Rite-Aid 3717 Fenton Rd.	11/28/2014	11:48	10.5	0.407	7.88	102	56.1

7.88 Avg



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Water Plant Supervisor

August 25, 2014

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

Mr. Adam Rosenthal,

Enclosed are the results from our 2014 3rd quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). We have added 15 sites to the 10 routine distribution sites to obtain a total of 25 samples. If you have any questions or comments, please contact me anytime.

Thank you,

DEQ
RESOURCE MANAGEMENT DIVISION

SEP 02 2014

LANSING DISTRICT

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint



Water Quality Monitoring

3rd Quarter 2014

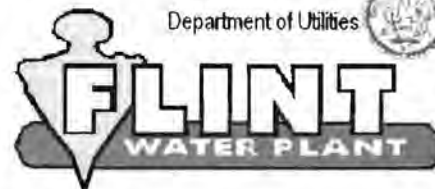
SAMPLE POINT IDENTIFICATION				PARAMETERS AND RESULTS				
Distribution System Location #	Sample Point Name & Address	Sample Date	Time	Temperature (C)	Conductivity (mS)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Calcium (mg/L Ca ²⁺)
#1	Arby's 3742 Davison Rd.	8/6/2014	10:36	23.0	0.388	7.74	60	49.7
#2	BP Gas Station 822 S. Dort Hwy	8/6/2014	10:49	23.9	0.372	7.76	70	52.1
#3	Liquor Palace 3302 S. Dort Hwy	8/6/2014	11:00	23.8	0.369	7.65	72	51.3
#4	Taco Bell 3606 Corunna Rd.	8/6/2014	11:34	26.8	0.359	7.69	74	53.7
#5	University Market 2501 Flushing Rd.	8/6/2014	11:47	26.5	0.383	7.56	80	56.9
#6	Salem Housing 3216 MLK Blvd.	8/6/2014	12:09	27.3	0.350	7.73	70	49.7
#7	Rite-Aid 5018 Clio Rd.	8/8/2014	10:22	20.9	0.387	7.74	78	50.5
#8	N. Flint Automotive 6204 N. Saginaw St.	8/6/2014	12:38	25.5	0.363	7.83	72	52.9
CS	Cedar Street Reservoir & Pump Station	8/6/2014	11:16	25.5	0.395	7.69	78	54.5
WS	West Side Reservoir & Pump Station	8/6/2014	11:57	26.5	0.406	7.56	82	52.1
N/A	Russell Collection Agency 3285 Van Slyke Rd	8/8/2014	11:12	25.6	0.370	7.78	74	55.3
N/A	Southwestern Academy High School 1420 W. 12th St.	8/8/2014	11:42	26.7	0.403	7.82	86	59.3
N/A	Cummings Elementary School G-2200 Walton St.	8/8/2014	11:00	25.8	0.359	7.62	76	53.7
N/A	Rite-Aid 3521 Corunna Rd.	8/8/2014	10:47	23.0	0.390	7.86	86	56.1
N/A	Kroger 2629 W. Pierson Rd.	8/6/2014	12:24	27.3	0.370	7.76	88	58.5
N/A	Tim Hortons 1274 Ballanger Hwy.	8/8/2014	10:35	21.9	0.411	7.73	86	56.1
N/A	Arby's 3559 S. Dort Hwy.	8/5/2014	11:19	23.1	0.401	7.63	88	61.7
N/A	Ya Ya's 519 S. Dort Hwy	8/5/2014	10:57	23.7	0.392	7.60	90	60.1
N/A	Taco Bell 1740 S. Dort Hwy	8/5/2014	11:09	23.2	0.412	7.60	90	60.9
N/A	Grandma's Recipe 3538 Richfield Rd.	8/5/2014	10:28	23.1	0.406	7.69	88	61.7
N/A	Flint City Hall 1101 S. Saginaw St.	8/5/2014	11:35	23.0	0.396	7.75	88	56.9
N/A	Quizzno's 3818 E. Court St.	8/5/2014	10:48	23.3	0.415	7.67	86	60.1
N/A	Whitehorse Tavern 621 W. Court St.	8/8/2014	11:53	26.1	0.390	7.81	78	57.7
'A	Flint Public Library 1026 E. Kearsley Rd.	8/8/2014	11:45	22.2	0.446	7.82	82	64.1
	Rite-Aid 3717 Fenton Rd.	8/8/2014	11:30	22.0	0.394	7.78	88	58.5

(7.71/1.5)



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Water Plant Supervisor

April 16, 2014

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

DEO
WATER MANAGEMENT DIVISION
APR 29 2014
LANSING DISTRICT

Mr. Adam Rosenthal,

Enclosed are the results from our 2014 2nd quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint.com



2014 2nd Quarter Water Quality Monitoring Results

SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	Arby's 3742 Davison Rd.	4/9/2014	8.9	7.59	76	1.03
#2	BP Gas Station 822 S.Dort Hwy	4/9/2014	7.5	7.57	77	1.12
#3	Liquor Palace 3302 S. Dort Hwy	4/9/2014	13.9	7.44	76	1.13
#4	Taco Bell 3606 Corunna Rd.	4/9/2014	8.3	7.44	76	1.09
#5	University Market 2501 Flushing Rd.	4/9/2014	8.7	7.42	76	1.07
#6	Salem Housing 3216 MLK Blvd.	4/9/2014	15.7	7.48	77	1.06
#7	Rite-Aid 5018 Clio Rd.	4/9/2014	8.8	7.50	77	1.07
#8	N. Flint Automotive 6204 N. Saginaw St.	4/9/2014	15.6	7.46	76	1.09
CS	Cedar Street Reservoir & Pump Station	4/9/2014	5.9	7.50	76	1.08
WS	West Side Reservoir & Pump Station	4/9/2014	6.7	7.47	76	1.10



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Water Plant Supervisor

February 3, 2014

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

DEO
RESOURCE MANAGEMENT DIVISION
FEB 25 2014
LANSING DISTRICT

Mr. Adam Rosenthal,

Enclosed are the results from our 2014 1st quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint.com



2014 1st Quarter Water Quality Monitoring Results

SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	Arby's 3742 Davison Rd.	1/29/2014	8.4	7.48	72	1.12
#2	BP Gas Station 822 S.Dort Hwy	1/29/2014	7.4	7.46	71	1.17
#3	Liquor Palace 3302 S. Dort Hwy	1/29/2014	10.0	7.40	73	1.04
#4	Taco Bell 3606 Corunna Rd.	1/29/2014	7.9	7.44	72	1.17
#5	University Market 2501 Flushing Rd.	1/29/2014	6.4	7.47	74	1.16
#6	Salem Housing 3216 MLK Blvd.	1/29/2014	9.2	7.44	72	1.12
#7	Rite-Aid 5018 Clio Rd.	1/29/2014	7.9	7.54	73	1.05
#8	N. Flint Automotive 6204 N. Saginaw St.	1/29/2014	10.7	7.44	73	1.10
CS	Cedar Street Reservoir & Pump Station	1/29/2014	8.3	7.53	73	1.09
WS	West Side Reservoir & Pump Station	1/29/2014	7.1	7.48	72	1.12

DEQ
RESOURCE MANAGEMENT DIVISION

FEB 25 2014

LANSING DISTRICT



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Water Plant Supervisor

November 20, 2013

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

DEQ
RESOURCE MANAGEMENT DIVISION

NOV 25 2013

LANSING DISTRICT

Mr. Adam Rosenthal,

Enclosed are the results from our 2013 4th quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint.com



2013 4th Quarter Water Quality Monitoring Results

SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	Arby's 3742 Davison Rd.	11/13/2013	17.3	7.49	76	1.00
#2	BP Gas Station 822 S.Dort Hwy	11/13/2013	15.0	7.52	74	1.15
#3	7-11 3302 S. Dort Hwy	11/13/2013	14.9	7.45	74	1.02
#4	Taco Bell 3606 Corunna Rd.	11/13/2013	14.6	7.47	73	1.06
#5	7-11 2501 Flushing Rd.	11/13/2013	15.3	7.48	74	1.03
#6	Salem Housing 3216 MLK Blvd.	11/13/2013	16.9	7.45	74	1.02
#7	Rite-Aid 5018 Clio Rd.	11/13/2013	16.6	7.53	77	1.10
#8	N. Flint Automotive 6204 N. Saginaw St.	11/13/2013	18.8	7.49	75	1.04
CS	Cedar Street Reservoir & Pump Station	11/13/2013	17.8	7.53	76	1.10
WS	West Side Reservoir & Pump Station	11/13/2013	16.1	7.50	75	1.21

DEQ
RESOURCE MANAGEMENT DIVISION

NOV 25 2013

LANSING DISTRICT



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Water Plant Supervisor

September 9, 2013

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

DEQ
REGULATORY MANAGEMENT DIVISION

OCT 10 2013

LANSING DISTRICT

Mr. Adam Rosenthal,

Enclosed are the results from our 2013 3rd quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint.com



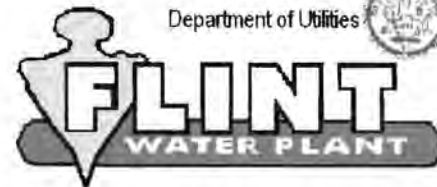
2013 3rd Quarter Water Quality Monitoring Results

SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	Arby's 3742 Davison Rd.	9/4/2013	22.6	7.76	74	1.15
#2	BP Gas Station 822 S.Dort Hwy	9/4/2013	23.6	7.58	75	1.16
#3	7-11 3302 S. Dort Hwy	9/4/2013	21.3	7.58	74	1.18
#4	Taco Bell 3606 Corunna Rd.	9/4/2013	21.8	7.52	75	1.23
#5	7-11 2501 Flushing Rd.	9/4/2013	24.4	7.53	75	1.08
#6	Salem Housing 3216 MLK Blvd.	9/4/2013	22.7	7.57	75	1.06
#7	Rite-Aid 5018 Clio Rd.	9/4/2013	22.2	7.75	76	1.10
#8	N. Flint Automotive 6204 N. Saginaw St.	9/4/2013	23.1	7.54	76	1.14
CS	Cedar Street Reservoir & Pump Station	9/4/2013	20.9	7.57	74	1.12
WS	West Side Reservoir & Pump Station	9/4/2013	21.4	7.52	75	1.15



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Water Plant Supervisor

June 3, 2013

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

DEQ
RESOURCE MANAGEMENT DIVISION
JUN 07 2013
LANSING DISTRICT

Mr. Adam Rosenthal,

Enclosed are the results from our 2013 2nd quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint.com



2013 2nd Quarter Water Quality Monitoring Results						
SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	Arby's 3742 Davison Rd.	5/1/2013	16.7	7.62	73	0.87
#2	BP Gas Station 822 S.Dort Hwy	5/1/2013	14.6	7.45	74	1.01
#3	7-11 3302 S. Dort Hwy	5/1/2013	14.1	7.38	74	1.02
#4	Taco Bell 3606 Corunna Rd.	5/1/2013	10.8	7.38	73	0.90
#5	7-11 2501 Flushing Rd.	5/1/2013	12.1	7.40	74	0.93
#6	Salem Housing 3216 MLK Blvd.	5/1/2013	12.7	7.40	73	0.85
#7	Rite-Aid 5018 Clio Rd.	5/1/2013	12.5	7.50	74	0.94
#8	N. Flint Automotive 6204 N. Saginaw St.	5/1/2013	16.3	7.41	73	0.81
CS	Cedar Street Reservoir & Pump Station	5/1/2013	10.5	7.47	75	0.86
WS	West Side Reservoir & Pump Station	5/1/2013	10.4	7.36	74	0.85

DEQ
RESOURCE MANAGEMENT DIVISION

JUN 07 2013

LANSING DISTRICT



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Water Plant Supervisor

DEQ
RESOURCE MANAGEMENT DIVISION

MAR 11 2013
LANSING DISTRICT

March 4, 2013

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

Mr. Adam Rosenthal,

Enclosed are the results from our 2013 1st quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint.com



DEQ
RESOURCE MANAGEMENT DIVISION

MAR 11 2013

LANSING DISTRICT

2013 1st Quarter Water Quality Monitoring Results

SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	Arby's 3742 Davison Rd.	2/27/2013	11.1	7.43	76	1.05
#2	BP Gas Station 822 S.Dort Hwy	2/27/2013	8.1	7.35	75	1.15
#3	7-11 3302 S. Dort Hwy	2/27/2013	11.1	7.31	73	1.21
#4	Taco Bell 3606 Corunna Rd.	2/27/2013	7.0	7.33	74	1.28
#5	7-11 2501 Flushing Rd.	2/27/2013	6.4	7.33	73	1.09
#6	Salem Housing 3216 MLK Blvd.	2/27/2013	10.3	7.38	74	0.96
#7	Rite-Aid 5018 Clio Rd.	2/27/2013	10.1	7.45	74	1.05
#8	N. Flint Automotive 6204 N. Saginaw St.	2/27/2013	14.3	7.33	75	1.10
CS	Cedar Street Reservoir & Pump Station	2/27/2013	8.4	7.42	73	1.03
WS	West Side Reservoir & Pump Station	2/27/2013	8.1	7.35	72	1.19



2012 4th Quarter Water Quality Monitoring Results						
SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	Arby's 3742 Davison Rd.	12/5/2012	15.0	7.49	76	1.27
#2	BP Gas Station 822 S.Dort Hwy	12/5/2012	13.6	7.44	75	1.37
#3	7-11 3302 S. Dort Hwy	12/5/2012	15.5	7.41	76	1.33
#4	Taco Bell 3606 Corunna Rd.	12/6/2012	12.1	7.56	75	1.38
#5	7-11 2501 Flushing Rd.	12/5/2012	13.1	7.43	75	1.19
#6	Salem Housing 3216 MLK Blvd.	12/5/2012	13.6	7.46	75	1.38
#7	Rite-Aid 5018 Clio Rd.	12/5/2012	15.9	7.56	77	1.24
#8	N. Flint Automotive 6204 N. Saginaw St.	12/5/2012	15.4	7.46	76	1.31
CS	Cedar Street Reservoir & Pump Station	12/5/2012	12.5	7.45	73	1.26
WS	West Side Reservoir & Pump Station	12/5/2012	10.5	7.43	73	1.21



2012 3rd Quarter Water Quality Monitoring Results						
SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	Arby's 3742 Davison Rd.	9/5/2012	23.7	7.66	76	1.13
#2	BP Gas Station 822 S.Dort Hwy	9/5/2012	23.7	7.51	75	1.22
#3	7-11 3302 S. Dort Hwy	9/5/2012	21.5	7.50	76	1.21
#4	Taco Bell 3606 Corunna Rd.	9/5/2012	22.6	7.52	74	1.23
#5	7-11 2501 Flushing Rd.	9/5/2012	25.1	7.51	76	1.19
#6	Salem Housing 3216 MLK Blvd.	9/5/2012	25.5	7.58	75	1.25
#7	Rite-Aid 5018 Clio Rd.	9/5/2012	22.1	7.56	76	1.24
#8	N. Flint Automotive 6204 N. Saginaw St.	9/5/2012	24.7	7.56	74	1.31
CS	Cedar Street Reservoir & Pump Station	9/5/2012	21.4	7.49	76	1.26
WS	West Side Reservoir & Pump Station	9/5/2012	22.3	7.49	76	1.21



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Water Plant Supervisor

DEQ
RESOURCE MANAGEMENT DIVISION

JUL 13 2012

LANSING DISTRICT

July 2, 2012

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

Mr. Adam Rosenthal,

Enclosed are the 2nd quarter results from our 2012 Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint.com



2012 2nd Quarter Water Quality Monitoring Results

SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	McDonalds Davison Rd.	6/13/2012	19.3	7.65	74	1.29
#2	BP Gas Station Dort Hwy	6/13/2012	20.3	7.60	75	1.16
#3	7-11 S. Dort Hwy	6/13/2012	19.8	7.52	76	1.15
#4	Taco Bell Ballenger Rd.	6/13/2012	18.3	7.49	75	1.13
#5	7-11 Flushing Rd.	6/13/2012	21.1	7.52	75	1.15
#6	Salem Housing MLK Blvd.	6/13/2012	21.0	7.60	74	1.16
#7	Rite-Aid Clio Rd.	6/13/2012	18.5	7.68	74	1.13
#8	N. Flint Automotive N. Saginaw St.	6/13/2012	20.2	7.57	74	1.11
CS	Cedar Street Reservoir & Pump Station	6/12/2012	14.6	7.46	71	1.27
WS	West Side Reservoir & Pump Station	6/12/2012	15.7	7.45	73	1.10



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



Brent Wright
Water Plant Supervisor

DEQ
RESOURCE MANAGEMENT DIVISION
DEC 12 2011
LANSING DISTRICT

November 22, 2011

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

Mr. Adam Rosenthal,

Enclosed are the results from our 2011 4th quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint.com



2011 4th Quarter Water Quality Monitoring Results

SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	Rite Aid 5018 Clio Rd.	11/17/2011	17.0	7.42	76	1.02
#2	7-11 2501 Flushing Rd.	11/17/2011	15.3	7.26	76	1.08
#4	Taco Bell Ballenger Rd.	11/17/2011	15.7	7.39	76	1.03
#6	7-11 3202 S. Dort Hwy	11/16/2011	15.0	7.41	76	1.02
#7	B&P Gas Station 822 S. Dort Hwy	11/16/2011	15.0	7.44	76	1.01
#9	North Flint Automotive 6204 N. Saginaw	11/16/2011	16.8	7.42	76	0.93
#10	McDonalds 3719 Davison Rd.	11/16/2011	18.1	7.55	76	1.01
#11	Salem Housing 3216 MLK Ave.	11/17/2011	14.7	7.36	76	1.00
CS	Cedar Street Reservoir & Pump Station	11/17/2011	15.1	7.32	76	1.12
WS	West Side Reservoir & Pump Station	11/17/2011	15.2	7.36	78	1.10



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities



2310
Department of Utilities

DEQ
RESOURCE MANAGEMENT DIVISION

OCT 03 2011

LANSING DISTRICT

Brent Wright
Water Plant Supervisor

September 28, 2011

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

Mr. Adam Rosenthal,

Enclosed are the results from our 2011 3rd quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint.com



2011 3rd Quarter Water Quality Monitoring Results						
SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	Rite Aid 5018 Clio Rd.	8/4/2011	21.7	7.34	76	1.48
#2	7-11 2501 Flushing Rd.	8/4/2011	24.3	7.31	74	1.40
#6	7-11 3202 S. Dort Hwy	8/2/2011	22.4	7.42	76	1.37
#7	B&P Gas Station 822 S. Dort Hwy	8/2/2011	23.0	7.54	76	1.32
#8	Seymours' Food Store 4602 Western Rd.	8/2/2011	23.4	8.15	82	0.82
#9	North Flint Automotive 6204 N. Saginaw	8/4/2011	23.3	7.37	75	1.52
#10	McDonalds 3719 Davison Rd.	8/2/2011	24.2	7.56	75	1.23
#11	Salem Housing 3216 MLK Ave.	8/4/2011	23.9	7.42	72	1.44
CS	Cedar Street Reservoir & Pump Station	8/2/2011	20.0	7.39	73	1.40
WS	West Side Reservoir & Pump Station	8/2/2011	19.4	7.37	74	1.39



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities

Waste & Hazardous
Materials Division

MAY 13 2011

Lansing District



Brent Wright
Water Plant Supervisor

May 3, 2011

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

Mr. Adam Rosenthal,

Enclosed are the results from our 2011 2nd quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint.com



2011 2nd Quarter Water Quality Monitoring Results						
SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	Rite Aid 5018 Clio Rd.	4/21/2011	13.7	7.06	75	1.23
#2	7-11 2501 Flushing Rd.	4/21/2011	11.2	7.12	75	1.43
#3	Dentist Office 3602 Beecher Rd.	4/19/2011	7.5	7.12	72	1.28
#6	7-11 3202 S. Dort Hwy	4/19/2011	12.3	7.07	73	1.26
#7	B&P Gas Station 822 S. Dort Hwy	4/19/2011	9.5	7.10	73	1.23
#8	Seymours' Food Store 4602 Western Rd.	4/19/2011	12.9	7.23	75	1.25
#9	North Flint Automotive 6204 N. Saginaw	4/21/2011	13.8	7.09	76	1.50
#10	McDonalds 3719 Davison Rd.	4/19/2011	12.5	7.19	74	1.23
#11	Salem Housing 3216 MLK Ave.	4/21/2011	11.7	7.16	73	1.48
CS	Cedar Street Reservoir & Pump Station	4/20/2011	6.1	7.26	74	1.37
WS	West Side Reservoir & Pump Station	4/20/2011	6.9	7.26	73	1.27



Dayne Walling
Mayor

DEPARTMENT OF UTILITIES
Water Plant & Facilities

Waste & Hazardous
Materials Division

FEB 25 2011

Lansing District



Brent Wright
Water Plant Supervisor

February 15, 2011

Adam Rosenthal, EQA
Department of Environmental Quality
Water Bureau - Field Operations

Mr. Adam Rosenthal,

Enclosed are the results from our 2011 1st quarter Water Quality Monitoring for the City of Flint Water Plant (WSSN 2310). If you have any questions or comments, please contact me anytime.

Thank you,

Mike Glasgow
City of Flint Water Plant
Laboratory & Water Quality Supervisor
(810)787-6537 ext. 3512
Mglasgow@cityofflint.com



2011 1st Quarter Water Quality Monitoring Results						
SAMPLE POINT IDENTIFICATION			PARAMETERS AND RESULTS			
Distribution System Location #	Sample Point Name & Address	Sample Date	Temperature (C)	pH (su)	Total Alkalinity (mg/L CaCO ₃)	Total Phosphorous (mg/L)
#1	Rite Aid 5018 Clio Rd.	1/12/2011	12.2	7.25	72	1.20
#2	7-11 2501 Flushing Rd.	1/12/2011	8.3	7.27	70	1.42
#3	Dentist Office 3602 Beecher Rd.	1/13/2011	7.8	7.17	69	1.37
#6	7-11 3202 S. Dort Hwy	1/12/2011	8.6	7.26	70	1.23
#7	B&P Gas Station 822 S. Dort Hwy	1/12/2011	8.2	7.30	72	1.68
#8	Seymours' Food Store 4602 Western Rd.	1/12/2011	10.2	7.34	72	1.37
#9	North Flint Automotive 6204 N. Saginaw	1/12/2011	10.3	7.30	70	1.41
#10	McDonalds 3719 Davison Rd.	1/12/2011	9.4	7.36	72	1.28
#11	Salem Housing 3216 MLK Ave.	1/12/2011	8.3	7.39	70	1.32
CS	Cedar Street Reservoir & Pump Station	1/13/2011	7.3	7.31	71	1.41
WS	West Side Reservoir & Pump Station	1/13/2011	6.2	7.25	68	1.39

City of Kent
Compliance

Date: January 14, 2013

EMERGENCY RESPONSE PLAN

for the City of Flint water supply system

In case of emergency, contact the Michigan Department of Natural Resources and Environment as soon as possible.

Considerations: Loss of pressure, inadequate quantities of water available, contamination

GENERAL

1. Personnel
See attached City of Flint Emergency Contacts.

2. Miscellaneous
List other telephone numbers that may be needed during emergencies:
 - a. Michigan Department of Natural Resources and Environment:
District Engineer/Sanitarian: Michael Prysby 517-335-6122
Environmental Quality Analyst: Adam Rosenthal 517-335-6131
Emergency Number: 1-800-292-4706
Fax:
 - b. Appropriate Municipal Officials: See attached contact list.
 - c. Local Health Department: See attached contact list.
 - d. Department of Agriculture: 810-230-8781
 - e. Police: 911
 - f. Fire Department: 911
 - g. Newspapers: See attached contact list.
 - h. Radio/TV Stations: See attached contact list.
 - i. Nearby Water Utilities: Genesee County 810-732-7870
 - j. Nearby Laboratories: See attached contact list.

3. Contractors

List telephone numbers of reputable contractors which may be needed during emergencies.

- a. Excavators: See attached contact list.
- b. Welders: See attached contact list.
- c. Electricians: See attached contact list.
- d. Plumbers: See attached contact list.

4. Suppliers

List telephone numbers of suppliers which may be needed during emergencies.

- a. Chemical Suppliers: See attached contact list.
- b. Pump Suppliers: See attached contact list.
- c. Water Main Repair Materials Supplier: See attached contact list.

CRITICAL CUSTOMERS

- 1. List critical customers or users for whom the provision of a continuous supply of safe water is most urgent. See attached contact list.
- 2. Describe method to provide critical customers with a continuous supply of water. The Utilities organization in conjunction with public health will identify available sources of potable water. The Flint Water Plant will commence emergency operations to augment water supply for Flint and Genesee County. The Genesee County Department of Public Health will inspect containers for storing and transporting potable water.

COMMUNICATIONS

- 1. Describe methods of communication available during power outages. Nextel's with 2 way capabilities.
- 2. Describe methods to provide customers or users with current information and recommended precautions to protect public health. Through the local media using the City of Flint's Communications Director. Contact list attached.

PLANS & AGREEMENTS

1. General Layout. Attached is the piping schematic for the City of Flint, valve and hydrant records can be obtained at the City of Flint Water Service Center.

what & where?

2. Personnel Safety Plans. For chemical release all water plant personnel are to evacuate to City Hall Dome. The operation foreman on duty is to remain and act as incident commander until Flint Fire and Genesee County HazMat team arrive. MSDS's are located in the operation center.

3. Water Sampling and Monitoring Plans. See attached City of Flint sampling site plan and EPA guidance for water utility response.

list plans / what & where

4. Mutual aid agreements. Mutual aid does exist between Flint and Genesee County, but most interconnects have been abandon. With the exception of Donaldson Road. This has been of concern for both Flint and Genesee County and discussions have taken place in regards to identifying key interconnects and putting back into service for emergencies.

what & where?

5. Emergency Supplies and Equipment Plans

- a. Emergency equipment available. See attached list.
- b. Replacement equipment. The Utilities Department obtains yearly purchase orders for equipment rentals from local rental companies.
- c. First aid supplies and equipment. The City of Flint Water Plant has first aid kits located through out the facility, and a first aid and safety storage room located near the chemical feed floor. First aid supplies can also be obtained from public safety.

6. Emergency shut down of 72" transmission main.

- a. Contact DWSD System Control: 313-267-6000 / 313-267-9000
- b. Contact Genesee County Water and Waste: 810-732-7870 after hours 810-732-2889
- c. Contact MDEQ

- d. Close valves at Baxter and Potter pit.
- e. Contact Water Plant personnel and commence start up of Water Plant.
- f. Contact City of Flint Water Service Center and have them locate brake on the 72" , *ok* transmission main. If possible isolate brake to lessen impact on Genesee County.
- g. Utilize finished water storage to meet community needs until plant is ready to be put online.

7. Water distribution system contamination.

- a. Identify source, location, and cause of pollutants; mobilize laboratory staff to determine the extent of the contamination.
- b. Notify MDEQ drinking water staff
- c. Issue public notification to either boil water or cease water use depending upon nature of contamination.
- d. Mobilize Water Service Center maintenance staff; begin valve closing to isolate contamination.
- e. Notify Sewer Maintenance and Wastewater Treatment Plant.
- f. Begin water distribution system flushing program.
- g. Continue flushing until contamination is removed.

SOURCE**Master Meter**

Location(s) and Size(s)
See attached list

*Attached list
Need to be updated*

Groundwater Sources N/A

Well Number	Diameter (inches)	Depth (feet)	Capacity (gpm)	Location	Treatment Type

Surface Water Sources

Pump Number	High or Low Service	Capacity (gpm)	Location
3	Low	25MGD	P.S.#4
4	Low	30MGD	P.S.#4
5	Low	20mgd	P.S.#4
6	Low	15mgd	P.S.#4

1. Describe method to operate wells for groundwater sources, or pumps for surface water sources (manual or automatic). All low service pumps are controlled manually. High service pumps are controlled through SCADA.

2. Auxiliary power available:

Type: Concrete slab mounted Cummins.

Location: Outside Water Plant boiler room.

Capacity: 20kw 20kva – 110/220 90.9a
115/230 87a
120/240 83.3a

Automatically starts when power is interrupted. Supplies power to lab and Operation Center SCADA.

Type: Trailer mounted portable Baldor TS25T

Location: Water Plant warehouse.

Capacity: 20kw 25kva – amps 30/69/60/30
Volts 120/208/240/480

If auxiliary power is leased, rented, shared or otherwise not immediately available on the property, describe the procedure for securing the equipment: N/A

Owner:

Contact name and telephone number:

Type and terms of agreement:

TREATMENT

1. If treatment employed at wells, describe method to provide auxiliary power to chemical feed pumps. N/A
2. If centralized treatment employed (iron removal, zeolite softening, etc.):
 - a. Describe method to provide auxiliary power to high service pumps:
 - b. Describe method to provide auxiliary power to chemical feed pumps:
 - c. Describe procedure to bypass treatment facility:
3. If no treatment, describe method to provide emergency chlorination: See attached
4. If surface water treatment employed, describe method to provide auxiliary power.

{

 There is no auxiliary power to run the Water Plant. The plant does have a dual feed from Consumer Energy, but that feed is supplied from a single grid.

DISTRIBUTION

1. Storage

Tank Type	Capacity	Location
Elevated Tank	2 MG	4500 N. Dort Hwy.
Dort Well	20 MG	4500 N. Dort Hwy
Pump Station #4	3 MG	4500 N. Dort Hwy.
Cedar Street Reservoir	20 MG	1100 Cedar St.
Westside Reservoir	12 MG	1416 DuPont St.

Describe procedure to bypass storage facility: Close valves to facility

2. Pumping stations:

- a. Identify location and capacity of pumps:
 - P.S. #3: 1100 Cedar St. 9MGD, 9MGD, 12MGD — *PROVISION*
 - P.S. #4: 4500 N. Dort Hwy. 6MGD, 12-20MGD, 12-20MGD.
 - P.S. #5: 1416 DuPont St. 4MGD, 4MGD, 8MGD, 8MGD.
 - Torrey Rd. Booster Station: 2800 Hammerburg Rd. 40hp, 120hp. — *PROVISION*
- b. Describe method to provide auxiliary power to pumps:
 - None at this time, looking into adding the ability to use portable generation.

3. Describe any emergency interconnections with other water supplies. List contact persons, telephone numbers and procedures to secure water from and provide water to those other water supplies. Genesee County Water and Waste: John O'Brian 810-732-7870, Dave Jansen 810-732-7870, Cell 810-919-6462. *what to where*

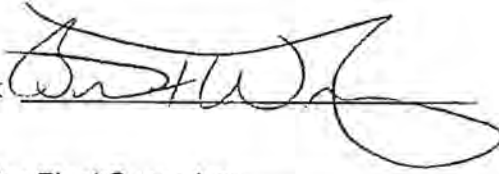
4. List available licensed water haulers and sources of bottled water with phone numbers.
See attached

ADDITIONAL INSTRUCTIONS

The Emergency Response Plan shall be located and distributed as necessary to assure effective use by all necessary waterworks personnel.

This plan shall be updated every 5 years or as necessary (as changes occur in personnel, contact information, or other factors).

Signature: _____

A handwritten signature in black ink, appearing to be 'D. Stutz', written over a horizontal line.

Title: Water Plant Supervisor

UTILITIES DEPARTMENT &
CITY OF FLINT CONTACT
INFORMATION

City of Flint Officials Contact list

Edward Kurtz	EFM	766-7346
Mike Brown	City Administrator	766-7346
Steven Todd	Communication Director	766-7346
Howard Croft	Director of Utilities	282-6549

EMERGENCY CONTACT NUMBERS UTILITIES DEPARTMENT

UTILITIES DIRECTOR

Howard Croft

Cell: 810-282-6549

UTILITIES DEPUTY DIRECTOR

Daugherty Johnson III

Cell: 810-577-8906

WATER PLANT

Brent Wright, Supervisor

Nextel: 691-0355

Home: 407-4583

WATER DISTRIBUTION

Robert Binsick, Supervisor

Nextel: 577-8267

SEWER MAINTENANCE

Robert Binsick, Supervisor

Nextel: 577-8267

WATER POLLUTION CONTROL FACILITY

Robert Case, Supervisor

Nextel: 577-6703

CITY OF FLINT WATER PLANT UTILITIES/EMPLOYEES

NAME	JOB TITLE	PHONE	CELL	NEXTEL
Alexander, Nicole	LABORATORY SPECIALIST	810.687.1563	810.610.0239	810.691.1963
Beckley, Michael	MAINTENANCE SUPERVISOR	NA	1.810.610.9145	810.577.8276
Bratton, Timothy	INSTRUMENT TECHNICIAN	1.810.658.5241	NA	810.577.8628
Childs, Thomas	OPERATIONS FOREMAN	1.810.496.4746	1.810.908.9191	810.577.8275
Duby, Robert	OPERATIONS FOREMAN	810.736.1027	1.810.922.2281	1.810.397.6424
Dungee, Scott	WATER PLANT MAINTAINER	810.736.8109	NA	810.577.8629
Echlin, Donald	WATER PLANT OPERATOR	810.686.3749	810.931.6157	NA
Glasgow, Michael	LABORATORY SUPERVISOR	810.820.0829	NA	810.577.0531
Goodman, Dempsey	BUILDING & GROUNDS	810.350.0047	810.922.0890	810.577.8631
Gray, Yolanda M.	ACCOUNTANT COORDINATOR	810.230.1138	NA	810.577.8272
Hurt, David	WATER PLANT MAINTAINER	1.989.288.3376	1.989.627.5656	NA
Jackson, Rodney	WATER PLANT OPERATOR	810.410.6686	na	810.577.8275
Kelly, Regina	PRINCIPAL CLERK TYPIST	NA	810.406.5604	810.577.8272
Kinnee, Kirwin J.	WATER PLANT MAINTAINER	810.217.0964	810.233.8649	NA
Koryciak, Christopher	MAINTENANCE SUPERVISOR	810.239.7905	810.964.7905	810.577.0895
McFarland, Matthew	OPERATIONS FOREMAN	810.515.6548	810.374.6115	810.577.8275
Stacker, Willie	BUILDING & GROUNDS	810.767.6553	810.813.5139	810.397.6389
Thomas, Glenn	CROSS CONNECTION INSPECTOR	810.244.4260	810.972.4349	810.691.0686
Wallace, Alvin	BUILDING & GROUNDS	NA	810.882.8551	810.577.1748
Wright, Brent	WATER PLANT SUPERVISOR	NA	810.407.4583	810.691.0355
Yanta, Charles	OPERATIONS FOREMAN	810.444.1005	810.348.4082	810.577.8275

Water Distribution Section Call Out List

NAMES	CLASS	PHONE	
BINCSEK, R.	exempt	577-8267	810-955-5978
<i>Foremen</i>			
SWICKARD	24	577-8263	
CHURCH, J.	24	397-2619	250-6131
SIMPSON	24	397-7247	577-9302
<i>Operators</i>			
VAUGHN	21	577-7180	810-397-4410
ROBERTS	21	730-3347	
<i>Maintainers</i>			
WOLF	20	965-6322	
AMBROSE	20	659-9000	810-247-0282
STOHON, P.	20	810-835-3155	
MOCHTY	20	955-8643	577-8268
YOUNG	20/21	810-691-5124	
VARGAS	20	810-210-7200	
RELERFORD	20	810-342-8842	810-577-1090
SATTIEWHITE	20	810-853-4528	789-4504
SOUTHALL	20	515-6857	
CHISM	20	810-955-3345	
JOHNSON	20	610-2537	
PAVWOSKI	20	252-8295	252-8295
WELLS	20	810-449-0723	
PATTERSON	20	810-397-1417	810-691-1986
<i>Trainee</i>			
ZIMMER	12	810-845-3538	
KENNEDY	12	810-252-4497	

GENESEE COUNTY EMERGENCY CONTACT LIST



Genesee County Health Department

Mark Valacak, M.P.H., Health Officer
Gary K. Johnson, M.D., M.P.H., Medical Director

<http://www.gchd.us>

Floyd J. McCree Courts &
Human Services Building
630 S. Saginaw Street
Flint, Michigan, 48502-1540
Phone: 810-257-3612
Fax: 810-257-3147

Community Health
Phone: 810-257-3612
Fax: 810-257-3147

Environmental Health
Phone: 810-257-3603
Fax: 810-257-3125

Personal Health
Phone: 810-257-3132
Fax: 810-237-6162

Burton Branch
G-3373 S. Saginaw St.
Burton, Michigan 48529
Phone: 810-742-2255
Fax: 810-742-2561

McCree North Health Center
115 E. Pierson Rd.
Flint, Michigan 48505
Phone: 810-600-2400
Fax: 810-785-9675

THIS MEMORANDUM SUPERCEDES THE 05/27/2010 MEMO (Discard previous releases on this subject)

To: 9-1-1 Central Dispatch, Genesee County
9-1-1 Central Dispatch, City of Flint
9-1-1 Emergency Dispatch Center, City of Fenton

From: Mark Valacak, Health Officer *MV*

Date: July 25, 2011

Subject: Notification Regarding Public Health Emergencies

Please contact Health Department officials in the order noted below until you reach a live person; should you receive a call about a public health emergency.

By memorandum, I have reminded local police, fire, and hospital officials in Genesee County to contact the Health Department directly in the event of disease outbreak, certain fires, sewage releases, power and water outages, possible bioterrorism, and other public health emergencies.

After regular hours, evenings, weekends and holidays when the Health Department is not open, I have asked officials to contact central dispatch at 9-1-1 to report these events.

MONDAY – FRIDAY 8:00 am – 5:00 pm	EVENINGS, WEEKENDS, & HOLIDAYS
Call Genesee County Health Department directly: (810) 257-3612 and press "9" for administrative services	Call in this order until a LIVE contact is made. Do NOT leave messages on voicemail. 1. Dorothy Wicks, EH Supervisor: (810) 730-3566 2. Brian McKenzie, EH Supervisor: (810) 694-9532 3. Dr. Gary Johnson, Medical Director: (810) 694-7520 or (810) 275-3609 4. Mark Valacak, Health Officer: (810) 629-8546 or (810) 275-3618

Thank you for your cooperation in this matter.

Genesee County Water and Waste Services

John O'Brian	Director	732-7870	
David Jansen	Assistant Director	732-7870	919-6462
Tim Davidek	Maintenance	732-7870	919-7417
Rich Bisco	Maintenance	732-7870	938-3418

Emergency after hours 732-2889

Genesee County Road Commission

767-4920 After Hours 911

Genesee County Emergency Manager

Jennifer Boyer 424-4403 After Hours 911

Critical Care Facilities

McLaren Medical Center	342-2307
Genesys Regional Medical Center	606-5710
Hurley Medical Center	257-9429
Heartland Health Care Center	736-0600
Hyde Park Memory Impaired Home	659-7000
Kith Haven Inc.	235-6676
Ledgerwood Adult Foster Care	238-6600
New Hope	742-3134
Willowsbrook Manor Inc.	733-0209
Genesee Valley Dialysis Center	733-2283
Hemcare Dialysis	687-6837

NEWSPAPERS
RADIO STATIONS
TELEVISION

City of Flint Communications Director

Steven Todd

766-7346

Newspapers

Flint Journal

767-7518

Saginaw News

517-752-3115

Television Stations

Channel 5-WNEM

989-758-2111

Channel 12-WJRT

810-257-2812

Channel 25-WEYI

810-687-9612

Channel 28-WFUM

810-233-6017

Channel 66-WSMH/FOX

810-785-8963

Radio Stations

WDZZ-WFDF

810-238-7310

WWCK

810-743-2500

WFBE

810-720-9513

WCRZ

810-742-5170

WFLT

810-239-7134

WKCQ

989-752-9662

WHNN

989-790-1942

EMERGENCY RESPONSE EQUIPMENT

Equipment Inventory List by Department

Department: 0393 WATER DISTRIBUTION DIVISION

Equip ID	Description	Account Code	License Number	Year	Manufacturer	Model	Serial No
0052	1994 CHEVROLET S10 PICKUP	540.202	060X046	1994	CHEVROLET	S10	1GCCS14Z7RK118750
4307	2006 CHEVROLET 2500 HD 2WD PKUP	540.202	059X879	2006	CHEVROLET	C2500HD-2WD	1GCHC24U26E254212
5400	NEW HOLLAND TC30 TRACTOR	540.202		2006	NEW HOLLAND	TC30V4	Z6NGC1311
6038	2000 MITSUBISHI FORK LIFT	234.100		2000	FG-25K	FG-25K	AF17B-11467
7010	2003 CHEV ASTRO VAN	540.202	059X787	2003	CHEVROLET	ASTRO VAN	1GCDM19X73B143371
7011	2003 CHEV ASTRO VAN	540.202	059X782	2003	CHEVROLET	ASTRO VAN	1GCDM19X53B143367
7033	2006 CHEVROLET 2500HD 2WD PKUP	540.202	059X644	2006	CHEVROLET	C2500HD-2WD	1GCHC24U76E254528
7036	2006 CHEVROLET 2500HD 4WD PKUP	540.202	059X911	2006	CHEVROLET	C2500HD-4WD	1GCHK24U66E257875
7101	1992 CHEVROLET 3/4T 2WD PICKUP	540.202	059X999	1992	CHEVROLET	C20	1GCGC24X0NE209205
7109	CHEVY 1/2T 2WD PICKUP	540.202	059X606	2004	CHEVROLET	D10	1GCEC14X34Z274773
7133	SILVERADO 3500 4WD	540.202	059X892	2004	CHEVROLET	C35	1GBJK34G74E300090
7149	1991 GMC 3/4T 2WD PICKUP	540.202	059X759	1991	GMC	C20	1GTFC24H2ME523445
7150	1991 GMC 3/4T 2WD PICKUP	540.202	059X996	1991	GMC	C20	1GTFC24H9ME522972
7154	CHEVY 3/4T 4WD EXT CAB TRUCK	540.202	059X858	2004	CHEVROLET	3/4T 4X4 P/U	1GCHK29U84E297056
7155	CHEVY 4X4 EXT CAB	540.202	059X940	2004	CHEVROLET	3/4T 4X4 P/U	1GCHK29U34E295442
7159	3/4T CHEVY	540.202	059X768	2004	CHEVROLET	3/4T PICKUP	1GCHK24U54E299600
7160	CHEVY 3/4T 4X4	540.202	059X890	2004	CHEVROLET	3/4T 4X4 P/U	1GCHK24U44E290830
7184	1997 CHEVROLET EXT CAB 3/4T 2WD	540.202	059X894	1997	CHEVROLET	C20	1GCF29R9VE208449
7197	2003 CHEV C4500/FLAT BED	540.202	059X846	2003	CHEVROLET	C4500	1GBC4E1E93F517683
7198	2003 CHEV C4500/ FLAT BED	540.202	059X931	2003	CHEVROLET	C4500	1GBC4E1E43F517445
7295	2000 CHEVROLET VENTURE VAN	540.202	059X766	2000	CHEVROLET	VENTURE	1GNDX03E0YD290076
7328	2007 PETERBILT TANDEM DUMP	540.202	059X669	2007	PETERBILT	357	1NPAL00X47N730492
7331	7400 6X4 INTL DUMP	540.202	059X866	2005	INTERNATIONAL	7400 6X4	1HTWHAATX5J045310
7332	7400 6X4 INTL DUMP	540.202	059X860	2005	INTERNATIONAL	7400 6X4	1HTWHAAT15J045311
7339	2001 GMC 10YD DUMP	540.202	059X615	2001	GMC	C8	1GDT7H4C51J507639
7425	1990 FORD 555 TRACTOR/LOADER/BAC	540.202		1995	JOHN DEERE	410D	T0410TG812938
7427	2001 TRACTOR/LOADER/BACKHOE	540.202		2001	NEW HOLLAND	L875	31031794
7428	2001 TRACTOR LOADER/BACKHOE	540.202		2001	NEW HOLLAND	L875	31031776
7431	2004 TEREX BACKHOE	540.202		2004	NEW HOLLAND	860	SMFH44EC04DGM2368
7432	2004 TEREX BACKHOE TRACTOR	540.202		2004	NEW HOLLAND	860	SMFH44EC04DGM2365
7433	2006 JD 410G BACKHOE	540.202		2006	JOHN DEERE	410G	T0410GX959767
7434	2006 JD 410G BACKHOE	540.202		2006	JOHN DEERE	410G	T0410GX959745
7437	2007 JD TRACTOR-LOADER-BACKHOE	540.202		2007	JOHN DEERE	410J	T0410JX167695
7438	2007 JD TRACTOR-LOADER-BACKHOE	540.202		2007	JOHN DEERE	410J	T0410JX167703

Equipment Inventory List by Department

Department: 0393 WATER DISTRIBUTION DIVISION

Equip ID	Description	Account Code	License Number	Year	Manufacturer	Model	Serial No
7494	PORTABLE LIGHT TOWER	540.202		2008	MAGNUM	MLT3060KMH	5AJLS16117B010290
7496	AIR COMPRESSOR	540.202	059X599	2007	SULLIVAN	D185-011	27584
7497	AIR COMPRESSOR	540.202	059X600	2007	SULLIVAN	D185-011	27586
7498	AIR COMPRESSOR	540.202	059X601	2007	SULLIVAN	D185-011	27626
7499	MILLER BIG BLUE 400P WELDER AND	540.202	060X019	2006	MILLER	400P	LG096395
7500	2004 SULLIVAN COMPRESSOR	540.202	059X895	2004	SULLIVAN	D185QV	23671
7501	1999 SULLAIR 185 CFM AIR COMPRES	540.202	54X026	1999	SULLIVAN	D185QV	18999A
7504	2002 GRUMMAN-OLSON WALK-IN VAN	540.202	059X790	2002	GRUMMAN	WORKHORSE	5B4KP42Y723340039
7505	2002 GRUMMAN-OLSON WALK-IN VAN	540.202	059X946	2002	GRUMMAN	WORKHORSE	5B4KP42Y323340040
7507	2002 GRUMMAN OLSON WALK-IN VAN	540.202	059X925	2002	GRUMMAN	WORKHORSE	5B4KP42Y523340038
7508	VALVE TURNING/CLEANING MACHINE	540.202	060X018	2005	DOHENY	VAL-TEC	1V9PT13115C112053
7509	1998 RODDER MACHINE TRAILER	540.202	060X014	1998	SEWER EQUIP CO.	RODDER TRAIL	7424
7511	MORGAN OLSON ROUTE STAR	540.202	060X069	2008	FREIGHTLINER	MT55	4UVAASDU78C260531
7512	MORGAN OLSON ROUTE STAR	540.202	060X070	2008	FREIGHTLINER	MT55	4UVAASDU58C260530
7513	MORGAN OLSON ROUTE STAR	540.202	060X071	2008	FREIGHTLINER	MT55	4UVAASDU98C260529
7514	MORGAN OLSON ROUTE STAR	540.202	060X072	2008	FREIGHTLINER	MT55	4UVAASDU78C260528
7515	2004 SULLIVAN COMPRESSOR	540.202	059X791	2004	SULLIVAN	D185QV	23702
7517	AIR COMPRESSOR	540.202	060X020	2004	SULLIVAN	185QQP	22571
7524	MORGAN OLSON ROUTE STAR	540.202	060X080	2008	FREIGHTLINER	MT45	4UZAAPDU78C208524
7526	MORGAN OLSON ROUTE STAR	540.202	060X078	2008	FREIGHTLINER	MT45	4UZAAPDU38C208522
7527	2009 CHEVROLET COLORADO 4DR PKUP	540.202	060X084	2009	CHEVROLET	COLORADO	1GCDT13EX98145776
7528	2009 CHEVROLET COLORADO 4DR PKUP	540.202	059X750	2009	CHEVROLET	COLORADO	1GCDT13E498145479
7529	2009 CHEVROLET COLORADO 4DR PKUP	540.202	059X978	2009	CHEVROLET	COLORADO	1GCDT13E398145425
7530	SOLAR ASSIST FLASHING ARROW BOAR	540.202	059X829	2009	ALLMAN	AB220/SEAPF	0082AB09
7532	TANDEM AXLE UTILITY TRAILER	540.202	059X821	2010	BIG TEX	10CC-18BK	16VCX182XA2H46960
7533	TANDEM AXLE UTILITY TRAILER	540.202	059X794	2010	BIG TEX	10CC-18BK	16VCX1825A2H46963
7534	TANDEM AXLE UTILITY TRAILER	540.202	059X810	2010	BIG TEX	10CC-18BK	16VCX1827A2H46964
7536	2004 SULLIVAN COMPRESSOR	540.202	060X012	2010	SULLIVAN	D185DEQ	201002250092
7873	SMALL EQUIPMENT	540.202		1999	MISC	SMALL EQUIP	7873

63 Equipment Unit(s) Assigned to Department

Equipment Inventory List by Department

Department: 0394 WATER PLANT

Equip ID	Description	Account Code	License Number	Year	Manufacturer	Model	Serial No
7025	2006 CHEVROLET COLORADO 4DR PKUP	545.202	059X876	2006	CHEVROLET	COLORADO	1GCDT136268282490
7026	2006 CHEVROLET COLORADO 4DR PKUP	545.202	059X917	2006	CHEVROLET	COLORADO	1GCDT136968284298
7027	2006 CHEVROLET 2500HD 4WD PKUP	545.202	059X873	2006	CHEVROLET	C2500HD-4WD	1GCHK24U06E259170
7028	2006 CHEVROLET 2500HD 4WD PKUP	545.202	059X869	2006	CHEVROLET	C2500HD-4WD	1GCHK24U66E260033
7110	3/4T CHEVY 4X4 PICKUP	545.202	059X887	2004	CHEVROLET	C2500HD-2WD	1GCHC24U44E293672
7111	CHEVY 3/4T PICKUP	545.202	059X849	2004	CHEVROLET	C2500HD-2WD	1GCHC24U64E292958
7118	3/4T 4X4 PICKUP	545.202	059X713	2004	CHEVROLET	C2500HD-2WD	1GCHC24U34E294294
7119	1999 CHEVROLET 1 TON PICKUP	545.202	059X870	1999	CHEVROLET	C30	1GCHC34JXXF061902
7134	1999 CHEV 1 TON 4WD DUAL WHEEL P	545.202	059X863	1999	CHEVROLET	K30	1GCHK34J3XF070455
7158	ALL WHEEL ASTRO VAN	545.202	059X914	2004	CHEVROLET	ASTRO VAN	1GCDL19X148122097
7187	2003 CHEV 2500-2WD	545.202	060X049	2003	CHEVROLET	C2500HD-2WD	1GCHC24UX3E284781
7188	2003 CHEV C2500	545.202	059X718	2003	CHEVROLET	C2500HD-2WD	1GCHC24U53E279035
7189	2003 ASTRO VAN	545.202	059X847	2003	CHEVROLET	ASTRO VAN	1GNEL19X93B136386
7192	2003 CHEV3500EXCAB-4WD/PLOW	545.202	059X648	2003	CHEVROLET	C3500HD-4WD	1GCKJ39G43E277984
7193	2003 CHEV C3500-4WD/PLOW	545.202	059X848	2003	CHEVROLET	C3500HD-4WD	1GCKJ34G83E277364
7193A	WESTERN ICE BREAKER V-BOX SALT S	545.202		2006	WESTERN	ICE BREAKER	UNKNOWN S
7195	2003 CHEV C4500/CANOPY VAN	545.202	060X035	2003	CHEVROLET	C4500	1GBC4E1E63F516765
7206	CHEVY ASTRO VAN	545.202	059X864	2004	CHEVROLET	ASTRO VAN	1GCDL19XX4B122311
7207	CHEVY ASTRO VAN	545.202	059X912	2004	CHEVROLET	ASTRO VAN	1GCDL19X84B122355
7414	JD GATOR			1999	JOHN DEERE	TH 6X4	W006X4D010860
7415	JD 955 TRACTOR			1994	JOHN DEERE	955	LV0955D181126
7426	1999 JOHN DEERE F620 Z-TRACK MOW	545.202		1999	JOHN DEERE	F620	TCF620X012401
7712	20' FLATBED TRAILER	545.202	059X868	1998	PEQUEA	1018D0	4JADS2029WG000092
7750	WATER PLANT GENERATOR	545.202	059X945	2003	TRITON	BALDOR	4TCSU10463H510271
7751	MUSTANG TELEHANDLER FORKLIFT	545.202		2004	MUSTANG	742	T8040B6
7752	GENIE SCISSOR LIFT	545.202		2008	GENIE	GS1930	3S3008B-96007
7753	JD 1445 4WD DIESEL LAWN TRACTOR	545.202		2003	JOHN DEERE	1445	TD1445D010021
7867	BOAT TRAILER	545.202	059X657	1961	REPUBLIC	800	5947
7869	1999 JOHN DEERE F935 72IN MOWER	545.202		1999	JOHN DEERE	F935	MOF935X181474
7871	MISC SMALL EQUIPMENT WATER PLANT	545.202		1999	MISC	SMALL EQUIP	SMALL EQUIPMENT

30 Equipment Unit(s) Assigned to Department.

Equipment Inventory List by Department

Department: 0395 WATER POLLUTION CONTROL PLANT

Equip ID	Description	Account Code	License Number	Year	Manufacturer	Model	Serial No
2300	1998 CHEVROLET TAHOE	550.202	060X040	1998	CHEVROLET	TAHOE	1GNEK13RXWJ360743
7001	1997 CHEVROLET 1T G VAN	545.202	059X920	1997	CHEVROLET	G30	1GCHG39R6V1052882
7002	1997 CHEVROLET 1T G VAN	550.202	059X935	1997	CHEVROLET	G20	1GCGG25R9V1052502
7005	2003 CHEV C2500-2WD	550.202	059X926	2003	CHEVROLET	C2500HD-2WD	1GCHC24U53E280511
7006	2003 CHEV C2500-2WD	550.202	059X927	2003	CHEVROLET	C2500HD-2WD	1GCHC24U93E281435
7007	2003 CHEVC35004WD/PLOW	550.202	059X933	2003	CHEVROLET	C3500HD-4WD	1GCHC34G33E283136
7008	2003 CHEV C3500 1TON VAN	550.202	059X937	2003	CHEVROLET	C3500	1GCHG35U131218197
7009	2003 CHEV C3500 1TON VAN	550.202	060X003	2003	CHEVROLET	C3500	1GCHG35U331218184
7012	2009 CHEVROLET 2500HD 4WD PKUP	550.202	059X712	2009	CHEVROLET	C2500HD-4WD	1GCHK44K49F154284
7013	2009 CHEVROLET 2500HD 4WD PKUP	550.202	059X697	2009	CHEVROLET	C2500HD-4WD	1GCHK44K39F153434
7014	2009 CHEVROLET 2500HD 4WD PKUP	550.202	059X886	2009	CHEVROLET	C2500HD-4WD	1GCHK44K99F154426
7015	2009 CHEVROLET COLORADO 4DR PKUP	550.202	059X835	2009	CHEVROLET	COLORADO	1GCDT13E898150944
7016	2009 CHEVROLET COLORADO 4DR PKUP	550.202	059X819	2009	CHEVROLET	COLORADO	1GCDT13EX98155661
7017	2009 CHEVROLET COLORADO 4DR PKUP	550.202	059X752	2009	CHEVROLET	COLORADO	1GCDT13EX98155076
7029	2006 CHEVROLET 2500HD 4WD PKUP	550.202	059X924	2006	CHEVROLET	C2500HD-4WD	1GCHK24U26E256643
7030	2006 CHEVROLET 2500HD 2WD PKUP	550.202	059X941	2006	CHEVROLET	C2500HD-2WD	1GCHC24U36E253585
7031	2006 CHEVROLET 2500HD 2WD PKUP	550.202	059X952	2006	CHEVROLET	C2500HD-2WD	1GCHC24U06E254919
7032	2006 CHEVROLET 2500HD 2WD PKUP	550.202	059X913	2006	CHEVROLET	C2500HD-2WD	1GCHC24U06E254880
7034	2006 CHEVROLET 2500HD 2WD PKUP	550.202	059X965	2006	CHEVROLET	C2500HD-2WD	1GCRC24U16E253391
7035	2006 CHEVROLET 2500HD 2WD PKUP	550.202	059X938	2006	CHEVROLET	C2500HD-2WD	1GCHC24U96E253753
7114	1/2T 2WD PICKUP	550.202	059X953	2004	CHEVROLET	1/2T 2WD PIC	1GCBC14X942274681
7116	CHEVY 1 TONE VAN	550.202	059X877	2004	CHEVROLET	C3500	1GCHG35U541196335
7135	4X4 CHEVY SUBURBAN TRUCK	550.202	059X936	2004	CHEVROLET	SUBURBAN	1GNFK16234J250646
7144	1999 CHEVROLET 3/4 TON PICKUP	550.202	059X934	1999	CHEVROLET	X20	1GCGK24J5XR701839
7181	1996 CHEVROLET 3/4T 2WD PICKUP	550.202	059X975	1996	CHEVROLET	C20	1GCFC24M9TE168608
7205	1999 CHEVROLET ASTRO VAN	550.202	059X964	1999	CHEVROLET	M10	1GNDM19W1XB137957
7341	1999 CHEVROLET MED DUTY DUMP	550.202	520X48	1999	CHEVROLET	C7	1GBJ7B1B4XJ103722
7402	15 TON CRANE	550.202		1996	P&H OMEGA	DH-22-1	E-49713
7423	1993 FORD 655D TRACTOR/LOADER/BA	550.202		1993	FORD	655	A420324
7510	WPC AIR COMPRESSOR	550.202	060X16	1991	SULLIVAN	D185-05	11097
7701	CLARK FORKLIFT	550.202		2000	CLARK	SSC MD-02N	695543/S-1
7823	WPC WELDER	550.202	30X502	1985	HOEART	G-213	AAW-90447
7866	1999 JOHN DEERE P935 72IN MOWER	545.202		1996	JOHN DEERE	345	M00345A022864

Equipment Inventory List by Department

Department: 0395 WATER POLLUTION CONTROL PLANT

Equip ID	Description	Account Code	License Number	Year	Manufacturer	Model	Serial No
7872	SMALL EQUIPMENT	550.202		1999	MISC	SMALL EQUIP	7872
7902	TRAILER MOUNTED GENERATOR	550.202	059X958	2007	GENERAC	8388470100	2094001
7903	TRAILER MOUNTED GENERATOR	550.202	060X089	2008	GENERAC	8388470100	2099061
7904	TRAILER MOUNTED GENERATOR	550.202	060X097	2008	GENERAC	8388470100	2101065
7905	7X18 10K HD EQUIPMENT TRAILER	550.202	059X889	2011	CARRY-ON	1021 KG	4YMJE182BG030448

38 Equipment Unit(s) Assigned to Department

Equipment Inventory List by Department

Department: 0396 SEWER MAINTENANCE DIVISION

Equip ID	Description	Account Code	License Number	Year	Manufacturer	Model	Serial No
5015	1995 VOLVO WG64 LOADMASTER REFUS	540.208	059X679	1995	VOLVO	WG64	4V2JCMBE9SR839993
7024	1997 CHEVROLET 1T 2WD UTILITY	540.208	059X981	1997	CHEVROLET	C30	1GBJC34R2VF039588
7037	2006 CHEVROLET 2500HD 2WD PKUP	540.208	059X767	2006	CHEVROLET	C2500HD-2WD	1GCHC24U46E255183
7038	2006 CHEVROLET 2500HD 2WD PKUP	540.208	059X859	2006	CHEVROLET	C2500HD-2WD	1GCHC24U96E254434
7039	2006 CHEVROLET EXT CAB 4X4 2500H	540.208	060X023	2006	CHEVROLET	C2500HD-4WD	1GCHK29U26E258627
7040	2006 CHEVROLET 2500HD 2WD PKUP	540.208	059X909	2006	CHEVROLET	C2500HD-2WD	1GCHC24U46E253689
7157	ASTRO VAN	540.208	059X765	2004	CHEVROLET	ASTRO VAN	1GNEL19X848121797
7183	1997 CHEVROLET EXT CAB 3/4T 2WD	540.208	059X910	1997	CHEVROLET	C20	1GCFC29RXVE208475
7185	1997 CHEVROLET 3/4T 4WD PICKUP	540.208	060X044	1997	CHEVROLET	K20	1GCGK24R4V2236473
7186	1998 CHEVROLET 3/4T 2WD PICKUP	540.208	059X613	1998	CHEVROLET	C20	1GCFC24M3W2196031
7190	2003 CHEV C4500/FLAT BED	540.208	059X989	2003	CHEVROLET	C4500	1GBC4E1E63F517673
7191	2003 CHEV C3500 4WD/PLOW	540.208	059X652	2003	CHEVROLET	C3500HD-4WD	1GCKJ34GX3E283151
7194	2003 CHEV C4500/FLAT BED	540.208	059X979	2003	CHEVROLET	C4500	1GBC4E1E03F517569
7196	2003 CHEV C3500 4WD W/DUMP	540.208	059X980	2003	CHEVROLET	C3500HD-4WD	1GCKJ34GX3E292448
7314	1994 FORD/ VACTOR SEWER JET	540.208	059X651	1994	CHEVROLET	C7	1GB87H1J05J100374
7315	1999 STERLING/VACTOR SEWER JET	540.208	060X041	1999	STERLING	C7	2F2HR7BB4XAA73387
7316	2004 GMC JET	540.208	059X610	2004	GMC	C7	1GDM8C1C24F501572
7327	2007 PETERBILT TANDEM DUMP	540.208	059X649	2007	PETERBILT	357	1NPAL00X27N730491
7337	1992 IH TANDEM AXLE 10YD DUMP	540.208	059X902	1992	INTERNATIONAL	F2674	1HTGLAYR3NH392918
7351	1996 CHEV 1T STEP VAN SRECO TV U	540.208	059X988	1996	CHEVROLET	P30	1GDKP32Y0T3500683
7352	2007 CUES TV TRUCK	540.208	060X058	2007	CHEVROLET	C4500	1GBE4V1G57F419721
7400	1996 JOHN DEERE 690E TRACK EXCAV	540.208		1996	JOHN DEERE	690E	DW690EL551915
7411	1998 FREIGHTLINER/VACTOR COMB MA	540.208	059X970	1998	FREIGHTLINER	FL80	1FV6JJ8B2XH984408
7412	2004 STERLING MED DUTY VACTOR JE	540.208	059X789	2004	STERLING	C7	2F2HATAK54AM83855
7413	2007 STERLING VACTOR JET	540.208	059X724	2007	STERLING	C8	2F2HAWDA47AX52923
7429	2001 TRACTOR/LOADER/BACKHOE	540.208		2001	NEW HOLLAND	LB75	031031827
7430	2004 TEREX BACKHOE	540.208		2004	NEW HOLLAND	860	SMFH44TC04DGM2448
7435	2006 JD 410G BACKHOE	540.208		2006	JOHN DEERE	410G	T0410GX959739
7436	2007 JD TRACTOR-LOADER-BACKHOE	540.208		2007	JOHN DEERE	410J	T0410JX167647
7439	2007 JD TRACTOR-LOADER-BACKHOE	540.208		2007	JOHN DEERE	410J	T0410JX167772
7495	PORTABLE LIGHT TOWER	540.208		2008	MAGNUM	MLT3060KMH	SAJLS161978010294
7518	2004 SULLIVAN AIR COMPRESSOR	540.208	059X982	2004	SULLIVAN	D185QV	23474
7519	1999 SULLAIR 185 CFM AIR COMPRES	540.208	59X773	1999	SULLIVAN	D185QV	18675A

Equipment Inventory List by Department

Department: 0396

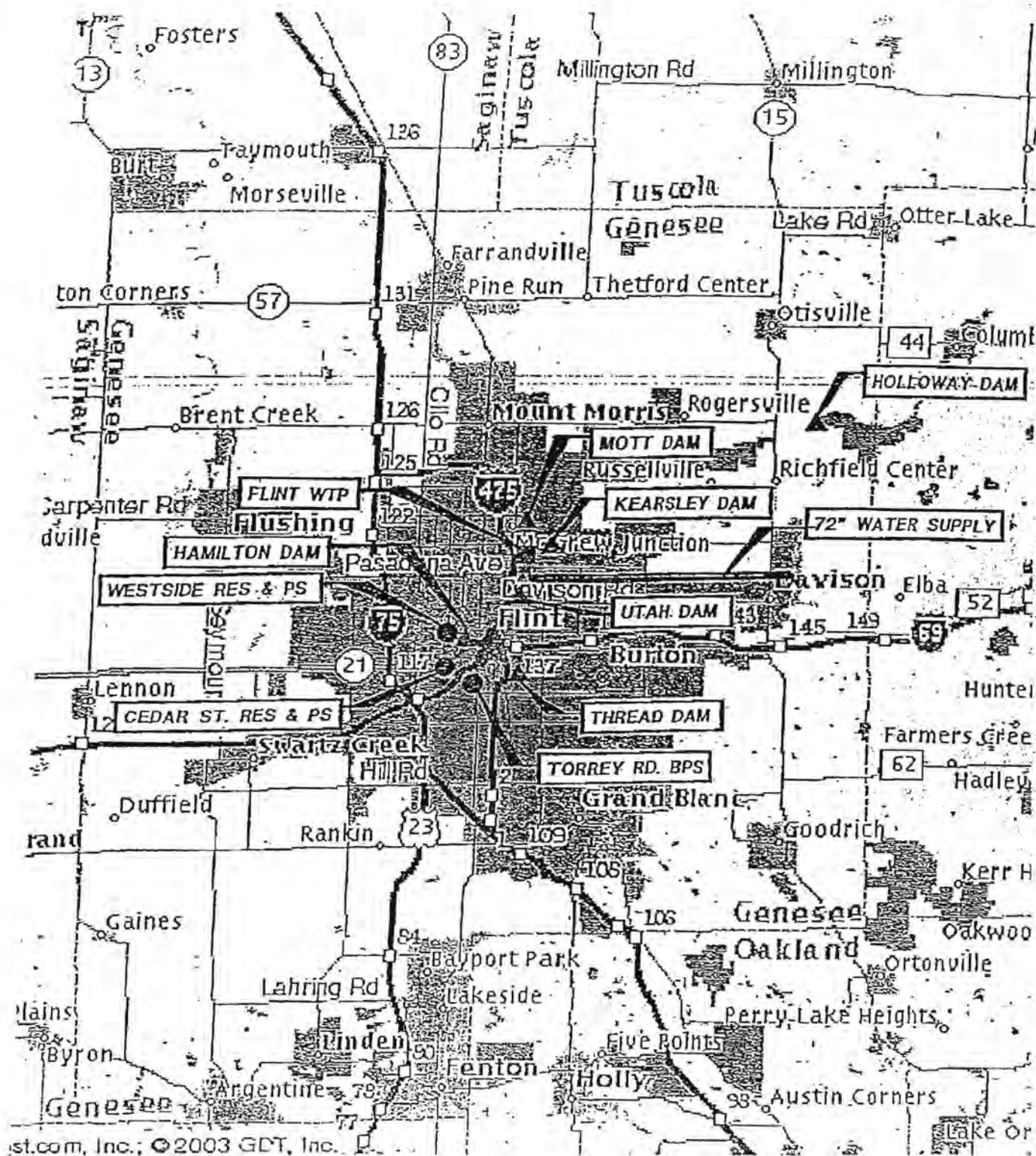
SEWER MAINTENANCE DIVISION

Equip ID	Description	Account Code	License Number	Year	Manufacturer	Model	Serial No
7520	1999 SULLAIR 185 CFM AIR COMPRES	540.208	059X983	1999	SULLIVAN	D185QV	18745A
7521	2000 GMC 10YD DUMP	540.208	059X977	2000	GMC	C8	1GDT7H4C4YJ524474
7522	2001 GMC 10YD DUMP	540.208	059X823	2001	GMC	C8	1GDT7H4C61J507651
7523	MORGAN OLSON ROUTE STAR	540.208	060X079	2008	FREIGHTLINER	MT45	4U2AAPDU58C208523
7525	MORGAN OLSON ROUTE STAR	540.208	060X081	2008	FREIGHTLINER	MT45	4U2AAPDU98C208525
7531	SOLAR ASSIST FLASHING ARROW BOAR	540.208	059X828	2009	ALLMAN	AB220/SEAPF	0081AB09
7535	TANDEM AXLE UTILITY TRAILER	540.208	059X785	2010	BIG TEX	10CC-18BK	16VCX1829A2H46965
7537	2004 SULLIVAN COMPRESSOR	540.208	059X739	2010	SULLIVAN	D185DPQ	201002250054
7802	2001 NATIONAL SIGNAL ARROWBOARD	540.208	059X994	2001	NATIONAL SIGNAL	177010	5HJ3R101765011953
7803	DIETZ TRAILER MTD TRAFFIC ARROW	540.208	059X885	1999	DIETZ	ARROWBOARD	70702385
7804	DIETZ TRAILER MTD TRAFFIC ARROW	540.208	060X028	1999	DIETZ	ARROWBOARD	70702686
7805	4" WHITEMAN TRASH PUMP	540.208	060X059	2000	WHITEMAN	TRASH PUMP	4GNFU01017Y8004386
7806	WHITEMAN 4" TRASH PUMP	540.208	059X997	2003	WHITEMAN	TRASH PUMP	4GNFU08183B008440
7807	WHITEMAN 4" TRASH PUMP	540.208	059X963	2003	WHITEMAN	TRASH PUMP	4GNFU08113B008439
7808	WHITEMAN 4" TRASH PUMP	540.208	059X969	2003	WHITEMAN	TRASH PUMP	4GNFU008123B008188
7809	WHITEMAN 4" TRASH PUMP	540.208	059X962	2003	WHITEMAN	TRASH PUMP	4GNFU081X3B008438
7819	WHITEMAN 4" TRASH PUMP	540.208	059X806	2007	SRF PUMPS	79000351	0056
7820A	BUCKET MACHINE TRAILER	540.208	060X016	1985	SEWER EQUIP CO.	BUCKET TRAIL	6142
7820B	BUCKET MACHINE TRAILER	540.208	060X015	1985	SEWER EQUIP CO.	BUCKET TRAIL	6143
7874	SMALL EQUIPMENT	540.208		1999	MISC	SMALL EQUIP	7874
7880	LARGE WPC TRASH PUMP	550.202	059X659	1989	LIQUA BLASTER	110DT	3907
7881	TRAILER MOUNTED TRASH PUMP	550.202	756X52	1995	GLOBAL PUMP CO	4-TAP-D3-T	9838009

55 Equipment Unit(s) Assigned to Department

CITY OF FLINT WATER SYSTEM INFORMATION

City of Flint Water System
Figure 1-2



Water Haulers

Great Lakes Water Supply
7720 Bray Rd.
Vassar MI
1-800-367-7523

Curtz Pool Water
9112 W. Mt. Morris Rd.
Mt. Morris MI
810-639-2837

Michigan Water Transport
810-744-6462

Contractors

Excavators:

Dean Holmes Excavating
810-653-9555

Conex
810-232-5350

Zito Construction
810-695-9025

L. D'Agostini & Sons
586-781-5800

Welders:

Delduca
810-743-1900

Delecki
586-784-9853

Iron Mike's
810-234-2996

Platinum Mechanical
810-244-9571

Electricians:

Weinstein Electrical
810-232-5934

Newkirk Electrical
810-742-4400

Suppliers

Chemical Supplies:

Chlorine: Jones Chemical
313-283-0676

Ferric Chloride: PVS Technologies
313-571-1100

Lox: Air Liquide
708-579-7977

Pump Supplies:

Kennedy 248-684-1200

HydroDynamics 248-623-4700

Water Main Repair:

Hanson Pipe & Precast
517-423-4779 / 734-834-0336

Michigan Pipe & Valve
810-691-0535

East Jordan Iron
248-546-2004

EMERGENCY CHLORINATION PROCEDURES

Chlorinations of the Flint Drinking water supply must be broken down into 2 categories. One being disinfection of drinking water reservoirs, and two being disinfection of mains. The procedure for each may be the same or may be very different.

The disinfection of a reservoir is done through the direct introduction of swimming pool chlorine into the main body of the reservoir by pouring into the roof-top openings. This, coupled with a partial draining of infected water inside the reservoir, insures a large dose of chlorine is introduced in a short time.

The amount of chlorine added will vary depending on the level of contamination involved in the event. After sufficient chlorine has been added, the reservoir must sit for a pre-determined amount of time. Parameters for time versus mg/l have been established by the MDEQ. Chlorine residual levels must be determined after all chlorine has been added and distributed through-out the reservoir by adding additional water from the fill valve on the station influent main. Additional chlorine may be added by injecting it into the fill line during the filling of the reservoir. This is the same method described in the disinfection of mains.

After the prescribed amount of time has elapsed, enough water must be added to dilute the chlorine to a maximum level of 1.0 PPM. The testing of the water will be described toward the end of this report.

After all testing is complete and the water is determined to be safe, the reservoir may be put back in normal service.

The disinfection of distribution mains is a regular part of water plant personnel duties, although in an emergency situation, much more inter-action between plant and Water Service Center personnel must take place.

The first item to be addressed must be how wide spread the contamination is. Areas of contamination must be isolated from the rest of the system prior to disinfecting, due to the high concentration of chlorine being introduced into the affected system. A comprehensive notification must be done, informing all residents **not** to use their water supply until further testing is completed. This testing will take a minimum of 3 full days.

The actual disinfection of the mains is fairly straight forward. After the area is identified and isolated, water plant and service center personnel will begin the chlorination of the mains.

The first step is to identify a place to pump pool chlorine into the system. A fire hydrant nearest the initial point of isolation may be used. A better spot would be a valve in a manway that still has a chlorination corp in the line downstream of the valve. Once the point is located, you need to locate a proper blow off site. The most preferred blow off point in this situation would be a hydrant at the end of the system.

When both sites have been established, the operators of the chlorination will return to the initial chlorination point. At that time, experienced water plant and service center personnel will hook a high pressure, low feed rate pump to the site and pump sufficient chlorine into the system to achieve a 50 PPM or higher free residual at the blow off point. If the site of origin is a hydrant, both water plant and service center personnel should have an altered hydrant cap that had a ¾" npt male fitting attached to the cap.

When the free residual has been achieved, both valves should be closed as close to the same time as possible. The disinfected main must remain isolated and the chlorine **must** remain at the high concentration for a

period of not less than 24 hours. If the residual is greater than 100 PPM, this time can be reduced to 12 hours.

At the end of the prescribed time period, a residual must be taken to insure the chlorine has remained in the mains. Once it has been established that the chlorine has remained, the main may then be blown off to clear the chlorine from it. After the water has returned to the normal residual of less than 1 PPM, a bacteria sample of 100ml will be taken by water plant personnel. The bottles to be used for this sampling will be provided by the water plant. This sample will then be taken to the water plant lab for analysis. The sample will take 24 hours for analysis. The next day, before the results are in on the first sample, a second blow off and sampling will take place. You must get 2 samples with a negative result before the main is considered ready for service. This sample procedure is exactly the same for a reservoir, minus the blow offs.

All necessary equipment, pool chlorine, and testing materials are stocked in sizable quantities at the Flint Water Plant, located on Dort Hwy. in Flint.

All maintenance and operations personnel at the Flint Water Plant have been trained in mains chlorination techniques, and all senior personnel are licensed to perform chlorinations and collect bacteriological samples.



Coliform Bacteria Distribution System Sample Site Plan

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General Information	1
Sample Site Locations, including up and down stream	2
Positive Sample Protocol & Notifications	3
Sample Site Location, Map	4

General Information

Water Supply Name:	City of Flint - Water Plant 4500 N. Dort Hwy Flint, MI 48505
Water Supply Serial Number:	2310
Population Served:	102,000
Number of monthly distribution samples required:	100
Number of Sampling Locations:	12
Sampling frequency:	At least twice weekly, varies with location.
Program Contact:	Michael Glasgow City of Flint Water Plant Laboratory & Water Quality Supervisor (810) 787-6537 ext. 3512 mglasgow@cityofflint.com

Routine Distribution System Sampling Site Locations

Site ID	Routine Site Name & Address	Up-Stream Site Name & Address	Down-Stream Site Name & Address
# 1	Arby's Restaurant	McDonalds Restaurant	Admiral Gas Station
	3742 Davison Rd.	3719 Davison Rd.	3802 Davison Rd.
	Flint, MI 48506	Flint, MI 48506	Flint, MI 48506
# 2	B & P Gas Station	Advasure Insurance	Rite Aid Pharmacy
	822 S. Dort Hwy	810 S. Dort Hwy	2838 E. Court St.
	Flint, MI 48503	Flint, MI 48503	Flint, MI 48506
# 3	7-11 Food Store	Mattress Savers	O'Rielly Auto Parts
	3302 S. Dort Hwy	3124 S. Dort Hwy.	3316 S. Dort Hwy
	Flint, MI 48507	Flint, MI 48507	Flint, MI 48507
# 4	Taco Bell Restaurant	Rite Aid Pharmacy	McFall's Collision
	3606 Courtna Rd.	3521 Courtna Rd.	3614 Courtna Rd
	Flint, MI 48532	Flint, MI 48532	Flint, MI 48532
# 5	7-11 Food Store	Serverance Service	Ambassador Bar
	2501 Flushing Rd.	2434 Flushing Rd.	1107 N. Chevrolet Ave.
	Flint, MI 48504	Flint, MI 48504	Flint, MI 48504
# 6	Salem Housing	B & P Gas Station	Hinky Dinky Market
	3216 M.L. King Blvd.	3317 M.L. King Blvd.	3110 M.L. King Blvd.
	Flint, MI 48505	Flint, MI 48505	Flint, MI 48505
# 7	Rite Aid Pharmacy	Urban League of Flint	Clio Rd. Coin Laundry
	5018 Clio Rd.	5005 Cloverlawn Dr.	4930 Clio Rd.
	Flint, MI 48504	Flint, MI 48504	Flint, MI 48504
# 8	North Flint Automotive	Al & Jerry's Mini Mart	Hutchinson's Food & Drug
	6204 N. Saginaw St.	6101 N. Saginaw St.	6509 N. Saginaw St.
	Flint, MI 48505	Flint, MI 48505	Flint, MI 48505
W.S.	West Side Reservoir & Pump Station	Water Main Sampler	Midway Market
	1416 Dupont St.	1430 Dupont St.	1360 Dupont St.
	Flint, MI 48503	Flint, MI 48504	Flint, MI 48504
C.S.	Cedar Street Reservoir & Pump Station	The Print Shop	City of Flint - Service garage
	1100 Cedar St.	1035 Ann Arbor St.	702 W. 12th St.
	Flint, MI 48503	Flint, MI 48503	Flint, MI 48503
Sta. #2 (II)	Water Plant Control Station #2	Baxter & Potter Rd. Control Station	Water Plant Laboratory Tap
	4500 N. Dort Hwy	G 12233 E. Potter Rd.	4500 N. Dort Hwy
	Flint, MI 48505	Davison, MI 48423	Flint, MI 48505
B&P	Baxter & Potter Rd. Control Station	Not Applicable*	Water Plant Control Station #2
	G 12233 E. Potter Rd.		4500 N. Dort Hwy
	Davison, MI 48423		Flint, MI 48505

* Baxter & Potter Rd. Control Station is the point at which The City of Flint takes control (& has access) on the pipeline.

Normal Sampling Frequency

Sites # 1 - # 8

Samples are collected twice weekly.

Usually collected on Wednesday by a lab analyst, & Thursday by a operator

W.S. & C.S.

Samples are collected Monday - Friday.

Usually collected along with sites # 1 - # 8 on Wednesday & Thursday to complete "city run".

Sta II and B&P

Samples are collected daily.

Positive Sample Protocol

Total Coliform Positive Sample:

- I. If a routine sample is positive for total coliform bacteria, notify Laboratory Supervisor immediately, and collect 3 repeat samples within 24 hours of determining the result. 1 repeat sample should be from the tap where the original total coliform –positive was taken. Repeat samples shall also be collected from upstream and downstream sites within 5 service connections of the original sampling site.
- II. If repeat samples are total coliform negative, no further sampling is required. Positive result and repeat results will be entered in the Monthly Operation Report (MOR).
- II. If 1 or more of the repeat samples in the set is total coliform positive, Notify Laboratory Supervisor, and collect an additional set of repeat samples. Laboratory Supervisor will notify Michigan DEQ with 24 hours or the next business day after learning the results, to determine further action.

Fecal Coliform Positive Sample:

- I. If a routine sample is positive for fecal coliform bacteria, notify Laboratory Supervisor, who will notify the DEQ immediately. Collect 3 repeat samples within 24 hours of determining the result. 1 repeat sample should be from the tap where the original fecal coliform –positive was taken. Repeat samples shall also be collected from upstream and downstream sites within 5 service connections of the original sampling site.

WATER QUALITY LABORATORY DIRECTORY

Table 4-3
Water Quality Laboratory Directory

Name	Contact	Telephone	Services	Biological Laboratory (Level)
Brighton Analytical Laboratory	Carrie McKissic	(810) 229-7575	wet chem, micro, metals, DBPR, HAA's, in state sample pick- ups.	None
Test America Laboratory	Sue Schafer	(248) 332-1940	wet chem, micro, metals, DBPR, HAA's, in state sample pick- ups.	None
KAR Laboratory	Garrett Ervin	(269) 381-9666	wet chem, micro, metals, DBPR, HAA's, in state sample pick- ups, low-level Hg sampling and analysis capability.	None

EPA GUIDANCE FOR WATER UTILITY RESPONSE



GUIDANCE FOR WATER UTILITY RESPONSE,
RECOVERY & REMEDIATION ACTIONS FOR
MAN-MADE AND/OR TECHNOLOGICAL
EMERGENCIES

Office of Water (4601M)
EPA 810-R-02-001
www.epa.gov/safewater
April 2002

DISCLAIMER

The statements in this document are intended solely as guidance. This document is not intended, nor can it be relied on, to create any rights enforceable by any party in litigation with the United States. EPA and state officials may decide to follow the guidance provided in this document, or to act in variance with the guidance, based upon an analysis of site-specific circumstances. This guidance may be revised without public notice to reflect subsequent changes in EPA's policy.

This document was prepared by Michael Baker Jr., Inc. for the EPA's Water Protection Task Force under contract EMW-2000-CO-0002.

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Introduction:

This document provides uniform response, recovery and remediation guidance for water utility actions in response to man-made and/or technological emergencies. The guidance was developed as an initiative of EPA's Water Protection Task Force and has been reviewed with water utilities and associations, EPA Regions, EPA Office of Water and other federal agencies. The intent of this guidance is to provide the minimum actions that EPA recommends be carried out by a water utility for the events described.

Emergency response planning is primarily a local responsibility. Good business practices suggest that every water utility have an Emergency Operations/Response Plan that is coordinated with state and local emergency response organizations, regulatory authorities and local government officials. Water utilities ought to consider whether the actions contained within this guidance have been thoroughly coordinated with these entities.

The Federal Response Plan (section VI) identifies Federal responsibilities and capabilities that can support the local response effort dependent upon the type and severity of the incident. Throughout this guidance "water system" includes the "system" elements of source water (ground and surface), drinking water treatment, drinking water distribution and storage, wastewater collection and wastewater treatment.

Background:

The Environmental Protection Agency (EPA) has been given the responsibility under Presidential Decision Directive (PDD) 63 for working with the Water Sector (including water and wastewater utilities) to provide for the protection of the nation's critical water infrastructure including the systems used to collect, treat and distribute potable water. The EPA has a similar responsibility for wastewater operations. These critical infrastructures are fundamental to the public health and welfare and are subject to both natural disasters such as floods and earthquakes, and man-made hazards such as terrorist attacks. Such disasters could place surrounding areas and populations at significant risk. In October, 2001 the EPA established an internal Water Protection Task Force to ensure that activities to protect and secure water supply infrastructure are comprehensive and carried out expeditiously. This guidance supports the Task Force's mission of providing information in an expeditious manner to public and private water utilities that can be used to protect public health and critical water infrastructure.

I. Incident types

This guidance was developed for five (5) different incident types:

- Threat of or Actual Intentional Contamination of the Water System
- Threat of Contamination at a Major Event
- Notification from Health Officials of Potential Water Contamination
- Intrusion through the Supervisory Control and Data Acquisition (SCADA); and
- Significant Structural Damage Resulting from an Intentional Act

While this guidance is oriented toward these 5 incident types, it should also serve as a guide for response, recovery and remediation actions for other threatened or actual intentional acts that would affect the safety or security of the water system.

II. Development of the Guidance

Each incident type was assessed for potential impact on water system operations and public safety to identify the minimum actions for each element of the water system to consider taking in response to the incident, recover from the incident and to remediate the impacts of the incident. Response refers to actions immediately following awareness of the incident, recovery refers to actions to bring the system back into operation, and remediation refers to longer term restoration actions. Where applicable, each incident type was assessed as if it had occurred separately at each of the system elements and the potential impacts were assessed upstream and downstream of the incident location. Additionally, the guidance was developed considering the response needs of large, medium and small water and wastewater systems. Water utilities should apply the concepts contained in the guidance to meet their system configuration and capabilities.

III. Structure:

The guidance provides recommended actions in the categories of Response Actions, Recovery Actions, and Remediation Actions in separate tables for each incident type. Each of these categories contain a section on notifications and utility actions. Where applicable, specific actions for each element of the water system are provided under the utility actions section.

The Notification Considerations section recommends standard notifications for any suspicious or threatened intentional man-made or technological emergency. Supplemental notifications are recommended within the incident tables for some events based on the potential impact of the event.

Response Planning:

This response, recovery and remediation guidance to intentional acts can be used to supplement existing water utility emergency operations plans (EOPs) developed to prepare for and respond to natural disasters and emergencies. EPA recommends that established policies and procedures contained in existing plans be used to the maximum extent while incorporating the recommendations in this guidance.

A high quality water utility EOP clearly delineates the organizational structure within the water system that will be responsible for incident response and management. This structure should identify specific individual roles and responsibilities for decision-making, logistics, operations, incident response control and finance. The structure could be based on the Incident Command System, or other similar system, that is compatible with the system(s) used by other elements (Fire, Law Enforcement, Emergency Management, Emergency Medical Services (EMS), etc.) of the community's incident response and management structure. It would be helpful to coordinate potential response requirements and expectations with local response organizations prior to an incident to ensure that the water utility's response needs are met.

Notification Considerations:

Water utilities that have established notification procedures to meet a regulatory requirement, such as the Emergency Planning and Community Right-to-Know Act (EPCRA), should use them as the starting point for developing broader notification procedures. Utilities that do not have established notification procedures should work with their Local Emergency Planning

Committee (LEPC) or similar local emergency planning organization, prior to an incident, to coordinate the specific procedures for contacting local, state and federal officials when an incident occurs. You can find the LEPC for your location at <http://www.epa.gov/ceppo/lepclist.htm>.

EPA expects that the facility would first call local law enforcement officials to initiate local emergency response actions. This may be accomplished by calling 911 or direct call to local law enforcement. The local notification coordination effort should determine which additional emergency response and management agencies (fire, Emergency Medical Services (EMS), the community emergency management organization and state agencies) need to be notified. For instance, do fire and EMS need to be notified in addition to law enforcement for a water-related incident?

The notification procedures developed within the local notification coordination effort should provide agency-specific names and contact numbers for these notifications on a 24-hour basis and define what information about the incident needs to be provided, who will make the notifications and which authorities are notified when a call is placed. As a minimum, these notification procedures should include protocols for notifying local and state health and environmental authorities, local critical care facilities (hospitals, dialysis centers, etc.) and others as identified in state and local requirements.

An intentional act to disrupt the operations of a water utility or to jeopardize public health is a criminal act. This creates the need for notifications to the appropriate FBI field office, National Response Center and other entities that may not normally be contacted in response to a natural disaster or emergency. Water utilities should work with the LEPC or similar organization, in conjunction with appropriate state offices, to verify how these additional notification requirements will be met and who has responsibility for the notifications.

The procedures developed within the local notification coordination effort should ensure that all of the entities listed below are notified, identify who the utility must contact to initiate the notifications and identify who within the organization should make the notifications. These organizations are not listed in any particular order of preference.

- Notify local law enforcement
- Notify local FBI Field Office (to begin the threat assessment process) Your local FBI field Office can be located by visiting <http://www.fbi.gov/contact/fo/info.htm> or in the front pages of your local telephone book
- Notify National Response Center 1-800-424-8802 (to notify pre-determined federal response agencies) for more information on NRC see <http://www.nrc.uscg.mil>
- Notify state/local emergency management organization
- Notify Governor's office
- Notify local EPA CID Special Agent in Charge (SAC)
- Notify other associated system authorities (wastewater, water)
- Notify local government official (responsible authority for the water utility)
- Notify state/local health, water and/or environmental department
- Notify critical care facilities
- Notify employees
- Notify EMS and Fire Department as deemed necessary
- Consider when to notify customers and what notification to issue

The recommendations provided in this guidance are supplemental to regulatory or other promulgated reporting requirements. Normal reporting/notification to state health and/or environmental agencies, or the EPA for states without approved state programs, will still be required when the impacts of an incident result in an inability to meet Water Quality or National Primary Drinking Water Standards or to meet CERCLA and/or EPCRA requirements.

Sampling:

The results of sample analysis after a threatened or actual contamination event can serve a critical role in determining response, recovery and remediation actions; assessing the potential impacts of the contaminant; and, providing data for eventual prosecution. Sampling requirements (quantity, type of sample container, environmental controls, type of sample, sample locations, etc.) can vary significantly depending upon the properties of the contaminant and where the contaminant was introduced into the system. This guidance provides recommendations for when sampling might be beneficial but can not provide specific sampling requirements for every potential contaminant.

It is important to ensure that sampling is conducted by trained personnel and that the safety of sampling and other personnel is fully considered while conducting sampling activities. The diversity of sampling capabilities and resources among large and small water utilities makes it difficult to establish standard requirements for all water utilities. Water utilities should work with their LEPC and appropriate local, state and federal agencies to develop procedures for obtaining requirements or recommendations on taking samples, sample control, sample distribution and use of sample analysis results on an event-by-event basis. The water utility's sampling capabilities and procedures for obtaining sampling recommendations should be contained within the utility's EOP.

In the event of an incident that is suspected or confirmed to be the result of an intentional act to disrupt the operations of a water utility or to jeopardize public health, law enforcement officials may also require/take additional samples for evidence preservation.

Annexes:

Annex I provides a Sample Collection, Identification and Chain-of-Custody Form and instructions for its use. The form is an example of the information needed for recording data on samples taken in response to an intentional act and for maintaining a record for chain-of-custody of the sample.

Annex II provides incident-specific response, recovery and remediation guidance for each of the five (5) incident types.

Annex I – Sample Collection, Identification and Chain-of-Custody Form

Sample Collection, Identification and Chain-of-Custody Form			
Sample ID # (Place ID Label Here)		Sample Date/Time	
Sample Description		Sample Location	
Comments			
Sampler Signature	Date/Time	Witness Signature	Date/Time
Print	Sample ID	Print	Location
1. Released by: Signature	Date/Time	Received by: Signature	Date/Time
Print	Sample ID	Print	Location
2. Released by: Signature	Date/Time	Received by: Signature	Date/Time
Print	Sample ID	Print	Location
3. Released by: Signature	Date/Time	Received by: Signature	Date/Time
Print	Sample ID	Print	Location
4. Released by: Signature	Date/Time	Received by: Signature	Date/Time
Print	Sample ID	Print	Location

Instructions for Sample Collection, Identification and Chain-of-Custody Form

Whether from an epidemiological or evidentiary standpoint, it is critically important that samples taken in response to an intentional act against a water system be taken in a systematic manner. Each sample collected should have a separate identifying number (Sample ID #) and the transfer of each sample should be documented. The Sample Collection, Identification and Chain-of-Custody Form provides a standardized format for annotating this information.

Sample Identification Number (Sample ID #)

Each sample should have separate identification number. A uniform system should be established for assigning sample identification numbers.

Sample Date/Time

Annotate the date and time that the sample was taken.

Sample Description

Describe the type of sample taken (water, sludge, sediment basin, etc.)

Sample Location

Annotate as specifically as possible where the sample was taken so that later samples can be taken (if necessary) from the exact same location.

Comments

Provide any additional comments that may assist in sample analysis (water temperature, humidity, how sample was taken or materials used to take sample, etc.).

Sampler Identification

The person taking the sample should sign his/her name in the **Signature** block, annotate the date/time of signature in the **Date/Time** block, print the sampler's name in the **Print** block and annotate the sample ID number from the **Sample ID#** block at the top of the form.

Witness Identification

The person witnessing the taking of the sample should sign his/her name in the **Signature** block, annotate the date/time of signature in the **Date/Time** block, print the sampler's name in the **Print** block and annotate the location of where the sample was taken from the **Sample Location** block at the top of the form.

Chain-of-Custody Tracking

A record of control for all samples should be maintained. Each person who releases control of the sample should maintain a copy of who the sample was released to. Persons who receive samples should verify the sample identification number **ON THE SAMPLE** before signing for receipt of the sample. The original copy of the form, with original signatures should remain with each sample until final disposition.

The person releasing the sample should sign his/her name in the **Signature** block, annotate the date/time of release in the **Date/Time** block, print the releaser's name in the **Print** block and annotate the sample ID number from the **Sample ID#** block at the top of the form.

The person receiving the sample should sign his/her name in the **Signature** block, annotate the date/time of receipt in the **Date/Time** block, print the receiver's name in the **Print** block and annotate the location where the sample was received in the **Location** block.

Other Considerations

Photographs

When possible a photograph should be taken of each collected sample at the sample location. Ideally, the photograph would show the completed sample ID label and security seals in-place. Photographs should be annotated or dated-stamped with the date and time that the photo was taken.



Water Utility Response, Recovery & Remediation Guidance for Man-made and/or Technological Emergencies

April 15, 2002

I. Contamination Event (Attributed Threat with Unspecified Material)

Event Description: This event is based on the threat of intentional introduction of a contaminant into the water system (at any point within the system) without specification of the contaminant by the perpetrator.

Initial Notifications:

- Notify local Law Enforcement
- Notify local FBI Field Office
- Notify National Response Center

Source Water

- Notify local/state emergency management organization
- Notify ISAC

Drinking Water Treatment Facility

- Notify other associated system authorities (wastewater, water)
- Notify local government official

Water Distribution / Storage

- Notify local/state health and/or environmental department
- Notify critical care facilities

Wastewater Collection System

- Notify employees
- Consider when to notify customers and what notification to issue
- Notify Governor

Wastewater Treatment Facility

RESPONSE ACTIONS

- Increase sampling at or near system intakes
- Consider whether to isolate the water source if possible

- Preserve latest full battery background test as baseline
- Increase sampling efforts
- Consider whether to continue normal operations (if determination is made to reduce or stop water treatment – provide notification to customers/issue alerts)
- Coordinate alternative water supply

- Consider whether to isolate the water in the affected area if possible

- Assess what to do with potentially contaminated water within the system based on contaminant, contaminant concentration, potential for system contamination, and ability to by-pass treatment plant.
- If by-passed-notify local & appropriate state authorities, & downstream users. Increase monitoring of receiving stream.

- Preserve latest full battery background test as baseline
- Increase sampling efforts
- Consider whether to continue normal operations (if determination is made to reduce or stop water treatment – provide notification to customers/issue alerts)

	Water Utility Response, Recovery & Remediation Guidance for Man-made and/or Technological Emergencies April 15, 2002 I. Contamination Event (Anticipated Threat with Unspecified Material)		
RECOVERY ACTIONS	Recovery actions should begin once the contaminant is through the system.		
Recovery Notifications:	• Notify Customers • Notify Media • Notify ISAC		
Appropriate Utility Elements:	• Sample appropriate system elements (storage tanks, filters, sediment basins, solids handling) to determine if residual contamination exists.	• Flush system based on results of sampling • Monitor health of employees	• Plan for appropriate disposition of personal protection equipment (PPE) and other equipment
REMEDIAL ACTIONS	• Based on sampling results – assess need to remediate storage tanks, filters, sediment basins, solids handling.	• Plan for appropriate disposition of PPE and other equipment	• If waste water treatment plant was by-passed – sample and establish monitoring regime for receiving stream and potential remediation based on sampling results.

Notes:

1. Response, recovery and remediation actions may be tailored to a specified (identified) material if the physical properties for the material are known.



Water Utility Response, Recovery & Remediation Guidance for Man-made and/or Technological Emergencies

April 15, 2002

II. Contamination Threat at a Major Event

Event Description: This event is based on the threat of, or actual, intentional introduction of a contaminant into the water system at a sports arena, convention center or similar facility.

Initial Notifications:	• Notify local Law Enforcement • Notify local FBI Field Office • Notify National Response Center • Notify ISAC	• Notify local/state emergency management organization • Notify wastewater facility • Notify Governor	• Notify other associated system authorities (wastewater, water) • Notify local government official	• Notify local/state health and/or environmental department • Notify critical care facilities	• Notify employees • Consider when to notify customers and what notification to issue
	Source Water	Drinking Water Treatment Facility	Water Distribution / Storage	Wastewater Collection System	Wastewater Treatment Facility
RESPONSE ACTIONS	• No recommended action to take	• No recommended action to take	• Coordinate isolation of water • Assist in plan for draining the contained water • Assist in developing a plan for sampling water for potential contamination based on threat notification • Provide alternate water source	• Coordinate acceptance of isolated water • Monitor accepted water • Assist in plan for draining the contained water • Assist in developing a plan for sampling water for potential contamination based on threat notification	

	Water Utility Response, Recovery & Remediation Guidance for Man-made and/or Technological Emergencies April 15, 2002 III. Contamination Threat of a Major Event
RECOVERY ACTIONS	Recovery actions should begin once the contaminant is through the system.
Recovery Notifications:	• Notify customers in the area of the facility of actions to take • Notify customers in affected area once contaminant-free clean water is re-established • Notify down-stream users such as water suppliers, irrigators, electric generating plants, etc.
Water Distribution / Storage	• Consider flushing system via hydrants in distribution systems
REMEDIATION ACTIONS:	Water Distribution/Storage • Assess need to decontaminate/replace distribution system components.
	Wastewater Treatment Plant • Based on sampling results – assess need to remediate storage tanks, filters, sediment basins, solids handling. • Plan for appropriate disposition of PPE and other equipment • If waste water treatment plant was by-passed – sample and establish monitoring regime for receiving stream and potential remediation based on sampling results.

Notes:



Water Utility Response, Recovery & Remediation Guidance for Man-made and/or Technological Emergencies

April 15, 2002

III. Notification from Health Officials of Potential Water Contamination

Event Description: This event is based on the water utility being notified by Public Health officials of potential contamination based on symptoms of patients.

Initial Notifications:	• Ask notifying official who else has been notified and request information on symptoms, potential contaminants and potential area affected	• Notify local Law Enforcement • Notify local FBI Field Office • Notify National Response Center • Notify local/state emergency management organization	• Notify other associated system authorities (wastewater, water) • Notify local government official • Notify Governor	• Notify local/state health and/or environmental department • Notify critical care facilities	• Notify employees • Consider when to notify customers and what notification to issue • Notify ISAC
	Source Water	Drinking Water Treatment Facility	Water Distribution / Storage	Wastewater Collection System	Wastewater Treatment Facility
RESPONSE ACTIONS	• Increase sampling at or near system intakes • Consider whether to isolate	• Preserve latest full battery background test result as baseline • Increase sampling efforts • Consider whether to continue normal operations (if determination is to reduce or stop water treatment – provide notification to customers/issue alerts) • Coordinate alternative water supply (if needed)	• Increase sampling in the area potentially affected and at locations where the contaminant could have migrated to. It is important to consider the time between exposure and onset of symptoms to select sampling sites • Consider whether to isolate • Consider whether to increase residual disinfectant levels	• Increase sampling at pumps stations and specifically in the area potentially affected • Assess what to do with potentially contaminated water within the system based on contaminant, contaminant concentration, potential for system contamination, and ability to by-pass treatment plant • If by-passed – notify local & appropriate state authorities, downstream users (especially drinking water treatment facilities) & increase monitoring of receiving stream	

	Water Utility Response, Recovery, & Remediation Guidance for Man-made and/or Technological Emergencies April 15, 2002 III. Notification from Health Officials of Potential Water Contamination		
RECOVERY ACTIONS	Recovery actions should begin once the contaminant is through the system.		
Recovery Notifications:	Assist health department with notifications to customers, media, downstream users and other organizations		
Appropriate Utility Elements:	Sample appropriate system elements (storage tanks, filters, sediment basins, solids handling) to determine if residual contamination exists.	- Flush system based on results of sampling - Monitor health of employees	Plan for appropriate disposition of personal protection equipment (PPE) and other equipment
REMEDIATION ACTIONS	Based on sampling results – assess need to remediate storage tanks, filters, sediment basins, solids handling and drinking water distribution system	Plan for appropriate disposition of PPE and other equipment	If waste water treatment plant was by-passed – sample and establish monitoring regime for receiving stream and potential remediation based on sampling results.

Notes: Patient symptoms should be used to narrow the list of potential contaminants.



Water Utility Response, Recovery & Remediation Guidance for Man-made and/or Technological Disasters

April 15, 2002

IV. Intrusion through Supervisory Control and Data Acquisition (SCADA)

Event Description: This event is based on internal or external intrusion of the SCADA system to disrupt normal water system operations.

Initial Notifications:

- Notify local Law Enforcement
- Notify local FBI Field Office
- Notify National Infrastructure Protection Center (NIPC) at 1-888-585-9078 (or 202-323-3204/5/6)
- Notify other associated system authorities (wastewater, water)
- Notify employees
- If the water is assessed to be unfit for consumption, consider when to notify customers and what notification to issue

RESPONSE ACTIONS

- | Source Water | Drinking Water Treatment Facility | Water Distribution / Storage | Wastewater Collection System | Wastewater Treatment Facility |
|--|---|---|--|-------------------------------|
| <ul style="list-style-type: none"> • Increase sampling at or near system intakes • Consider whether to isolate | <ul style="list-style-type: none"> • Preserve latest full battery background test as baseline • Increase sampling efforts • Temporarily shut down SCADA system and go to manual operation using established protocol • Consider whether to shut down system and provide alternate water | <ul style="list-style-type: none"> • Monitor unmanned components (storage tanks & pumping stations) • Consider whether to isolate | <ul style="list-style-type: none"> • Temporarily shut down SCADA system and go to manual operation using established protocol • Monitor unmanned components (pumping stations) – required only if wastewater SCADA system is compromised • If SCADA intrusion caused release of improperly treated water consider whether to continue normal operations (if determination is made to reduce or stop water treatment – provide notification to customers/issue alerts) | |

	Water Utility Response, Recovery & Remediation Guidelines for Man-made and/or Technological Emergencies April 15, 2002 IV. Intrusion through Supervisory Control and Data Acquisition (SCADA)		
RECOVERY ACTIONS	Recovery actions should begin once the intrusion has been eliminated and the contaminant/unsafe water (if this occurs) is through the system.		
Recovery Notifications:	• Employees • Local law enforcement • Notify customers and media if the event resulted in contamination and the full range (see scenario I) of standard notifications were made		
Appropriate Utility Elements:	• With FBI assistance, make an image copy of all system logs to preserve evidence.	• With FBI assistance, check for implanted backdoors and other malicious code and eliminate them before re-starting SCADA system	• Install safeguards before re-starting SCADA • Bring SCADA system up and monitor system
REMEDIATION ACTIONS	• Assess/implement additional protections for SCADA system. • Check for an NIPC water sector warning based on the intrusion that may contain additional protective actions to be considered. NIPC warnings can be found at www.NIPC.gov or at https://www.infragard.org for secure access Infragard members.		

Notes:



Water Utility Response, Recovery & Remediation Guidance for Man-made and/or Biological Incidents

April 15, 2002

V. Significant Structural Damage Resulting from an Intentional Act

Event Description: This event is based on intentional structural damage to water system components to disrupt normal system operations.

Initial Notifications:	• Notify local Law Enforcement • Notify local FBI Field Office • Notify National Response Center	• Notify local/state emergency management organization • Notify Governor • Notify ISAC	• Notify other associated system authorities (wastewater, water) • Notify local government officials	• Notify local/state health and/or environmental department • Notify critical care facilities	• Notify employees • Consider when to notify customers and what notification to issue
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	Source Water	Drinking Water Treatment System	Water Distribution / Storage	Wastewater Collection System	Wastewater Treatment Facility
RESPONSE ACTIONS	• Deploy damage assessment teams, if damage appears to be intentional then treat as crime scene – Consult local/state law enforcement and FBI on evidence preservation • Inform law enforcement and FBI of potential hazardous materials • Coordinate alternative water supply, as needed • Consider increasing security measures • Based on extent of damage, consider alternate (interim) treatment schemes to maintain at least some level of treatment				
RECOVERY ACTIONS	Recovery actions should begin as soon as practical after damaged facility is isolated from the rest of the utility facilities.				
Recovery Notifications:	• Employees • Law enforcement • Notify local FBI office				
Appropriate Utility Elements:	• Dependent on the feedback from damage assessment teams • Implement damage recovery plan				
REMEDIATION ACTIONS	• Repair damage. • Assess need for additional protection/security measures for damaged facility, and other critical facilities within the utility.				

Notes:

MICHIGAN DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT
WATER BUREAU
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
Authorized by Michigan Act 451, Public Acts of 1994, as amended, Part 31

CERTIFICATE OF COVERAGE (COC)

**Under General Permit No. MIG640000
Wastewater Discharge from Potable Water Supply General Permit**

COC NO.: MIG640053
DESIGNATED NAME: Flint WTP
PERMITTEE: City of Flint
MAILING ADDRESS: 1101 South Saginaw Street
Flint, Michigan 48502

This COC authorizes the permittee to discharge filter backwash, wastewater associated with the production of potable water from the City of Flint Water Treatment Plant located at 4500 North Dort Highway, Flint, Michigan 48505. Consistent with the criteria and requirements established in General Permit No. MIG640000, the permittee is authorized to discharge 19.2 MGD of filter backwash, wastewater associated with the production of potable water from Monitoring Point 002A through Outfall 002. Outfall 002 discharges to the Flint River in the SE1/4, NW1/4, Section 32, Town 8N, Range 7E, Genesee County.

Sections of the general permit applicable to this facility include: the cover page, Part I.A.3., Part I.A.6., and Part I.A.10. through Part II.E.6., inclusively.

References in the general permit to the Department shall be defined as the Lansing District Supervisor of the Water Bureau. The Lansing District Office is located at Constitution Hall, 4th Floor-North, 525 West Allegan, P.O. Box 30242, Lansing, Michigan, 48909, telephone: 517-335-4598, fax: 517-241-3571.

Any person who is aggrieved by this COC may file a sworn petition for a contested case hearing on this COC with the State Office of Administrative Hearings and Rules of the Michigan Department of Energy, Labor, and Economic Growth in accordance with the provisions of R323.2192(c) of the Michigan Administrative Code. The Department of Energy, Labor, and Economic Growth may reject any petition filed more than 60 days after issuance as being untimely.

The issuance of this COC does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Natural Resources and Environment (Department) permits, or approvals from other units of government as may be required by law.

This COC is based on a complete application received by the Department on March 10, 2010. The permittee is subject to all conditions specified in General Permit No. MIG640000 issued September 8, 2009, expiring April 1, 2015. This COC may be modified, terminated, reissued, or revoked as allowed for in General Permit No. MIG640000. On its effective date, this COC shall supersede COC No. MIG640053, issued February 10, 2005, which is hereby revoked.

This COC shall take effect on the date of issuance.

April 1, 2010
Date Issued

EQP 4677 (10/97)

Original Permit Signed by Michael Bray
Michael J. Bray, Chief
Lakes Erie and Huron Permits Unit
Permits Section
Water Bureau

April 1, 2010

City Clerk
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502

Dear Sir or Madam:

SUBJECT: National Pollutant Discharge Elimination System (NPDES)
Certificate of Coverage No. MIG640053
Designated Name: Flint WTP

Your Certificate of Coverage (COC), issued under NPDES General Permit No. MIG640000, has been processed in accordance with the appropriate State and Federal regulations.

The issuance of this COC does not authorize the violation of any federal, state, or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Natural Resources and Environment (DNRE; formerly the Department of Environmental Quality) permits, or approvals from other units of government as may be required by law.

Please carefully review the effluent limitations and monitoring requirements contained in General Permit No. MIG640000 and Certificate of Coverage No. MIG640053, which is enclosed. If you need a copy of the General Permit, one can be obtained via the Internet at: (<http://www.michigan.gov/deqnpdes> - click on "General NPDES Permits" which is under the Permits banner), or you may call 517-241-1346 to request a paper copy be sent to you. These requirements are subject to the criminal and civil enforcement provisions of both State and Federal law. Permit compliance and violations are audited by the DNRE and the United States Environmental Protection Agency.

You must comply with the limitations, monitoring requirements, and other responsibilities in accordance with General Permit No. MIG640000 and Certificate of Coverage No. MIG640053. Any reports, notifications, or questions regarding the NPDES program, the General Permit, or the enclosed COC should be directed to the DNRE office indicated on your COC.

Self-monitoring data is now required to be reported via the DNRE Electronic Environmental Discharge Monitoring Reporting (e2-DMR) system (see Part II.C.2. of the General Permit) unless stated otherwise in the General Permit or this letter. In accordance with the provisions of Part II.C.3. of General Permit No. MIG640000, the permittee is approved to conduct retained self-monitoring.

If your NPDES permit application included data on water treatment additives proposed for use at your facility, you will be contacted by the DNRE under separate correspondence. The enclosed COC does not authorize the discharge of water additives. You must receive written approval prior to discharging any additives from your facility other than additives which are approved under ANSI/NSF Standard 60 "Drinking Water Treatment Chemicals."

Permittee Name

NPDES Permit/Certificate of Coverage No.

Page 2

Sincerely,

Karen Lauterbach
Lakes Erie and Huron Permits Unit
Permits Section
Water Bureau
517-373-1326

kl/sea

Enclosure: Certificate of Coverage No. MIG640053

cc/enc: Mr. Brent F. Wright, Water Plant Supervisor, City of Flint Water Treatment Plant
Lansing District Office, Water Bureau, DNRE (electronic)
PCS Unit, Water Bureau
File

PERMIT NO. MIG640000

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTEWATER DISCHARGE GENERAL PERMIT**

**WASTEWATER DISCHARGE FROM
POTABLE WATER SUPPLY**

In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 *et seq.*) (the "Federal Act"), Michigan Act 451, Public Acts of 1994, as amended (the "Michigan Act"), Parts 31 and 41, and Michigan Executive Orders 1991-31, 1995-4, and 1995-18, discharges associated with the production of potable water is authorized to be discharged from facilities specified in individual "certificates of coverage" in accordance with effluent limitations, monitoring requirements and other conditions set forth in this general National Pollutant Discharge Elimination System (NPDES) permit (the "permit").

The applicability of this permit shall be limited to discharges associated with the production of potable water which includes wastewaters from the following types of potable water treatment facilities: oxidation/filtration, membrane filtration, chemical precipitation/filtration, and coagulation/filtration have been determined by the Michigan Department of Environmental Quality (the "Department") not to need an individual NPDES permit. Process flows contributing to the discharge include: filter backwash, filtration reject, decanted sludge dewatering, influent screen backwash, and/or miscellaneous waste streams associated with potable water facility operation. Miscellaneous waste streams authorized by this permit are waste streams with low pollutant volume content. These waste streams include but are not limited to: processed potable water, contact and noncontact cooling water, dehumidifier water, sump drainage water, hydraulic valve operator water, and pump seal water. Discharges which may cause or contribute to a violation of a water quality standard are not authorized by this permit.

In order to constitute a valid authorization to discharge, this permit must be complemented by a Certificate of Coverage issued by the Department.

Unless specified otherwise, all contact with the Department required by this permit shall be to the position(s) indicated in the Certificate of Coverage.

This general permit shall take effect **April 1, 2010**. The provisions of this permit are severable. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term in accordance with applicable laws and rules.

This general permit shall expire at midnight, **April 1, 2015**.

Issued September 8, 2009

Original Permit Signed by Daniel Dell
Daniel Dell, Chief
Permits Section
Water Bureau

PERMIT FEE REQUIREMENTS

In accordance with Section 324.3120 of the Michigan Act, the permittee shall make payment of an annual permit fee to the Department for each October 1 the permit is in effect regardless of occurrence of discharge. The permittee shall submit the fee in response to the Department's annual notice. The fee shall be postmarked by January 15 for notices mailed by December 1. The fee is due no later than 45 days after receiving the notice for notices mailed after December 1.

CONTESTED CASE INFORMATION

The terms and conditions of this general permit shall apply to an individual facility on the effective date of a Certificate of Coverage for the facility. The Department of Energy, Labor, and Economic Growth may grant a contested case hearing on this general permit in accordance with the Michigan Act. Any person who is aggrieved by this permit may file a sworn petition with the State Office of Administrative Hearings and Rules of the Michigan Department of Energy, Labor, and Economic Growth, setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Department of Energy, Labor, and Economic Growth may grant a contested case hearing on the Certificate of Coverage issued to an individual facility under this general permit in accordance with Rule 2192(c) (Rule 323.2192 of the Michigan Administrative Code)

PART I**Section A. Effluent Limitations And Monitoring Requirements****1. Final Effluent Limitations for Oxidation/Filtration Facilities**

During the period beginning on the effective date of this permit and the effective date of an individual Certificate of Coverage, and lasting until the expiration of this permit or termination of the individual Certificate of Coverage, the permittee is authorized to discharge wastewaters associated with the production of potable water to the surface waters of the state of Michigan. Such discharge shall be limited and monitored by the permittee as specified below.

Parameter	Maximum Limits for Quantity or Loading			Maximum Limits for Quality or Concentration			Frequency of Analysis	Sample Type
	Monthly	Daily	Units	Monthly	Daily	Units		
Retained Self-Monitoring Requirements, see Part II.C.3.								
Flow	(report)	(report)	MGD	---	---	---	Daily	Report Total Daily Flow
Total Suspended Solids	---	---	---	30	50	mg/l	Weekly	Grab
Total Iron	---	---	---	5.0	---	mg/l	Weekly	Grab
Outfall Observation	(report)	---	yes/no	---	---	---	Weekly	Visual

- a. **Narrative Standard**
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.
- b. **Monitoring Location**
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken of the discharge prior to mixing with the waters of the state of Michigan.
- c. **Outfall Observation**
Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported within 24 hours to the Department followed with a written report within five (5) days detailing the findings of the investigation and the steps taken to correct the condition.
- d. **Monitoring Frequency Reduction for Total Iron and Total Suspended Solids**
After the collection of three months of data, the permittee may request, in writing, Department approval of a reduction in monitoring frequency for Total Iron and Total Suspended Solids. This request shall contain an explanation as to why the reduced monitoring is appropriate and the summary of the collected data. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency indicated in Part I.A. 1. of this permit. The monitoring frequency for Total Iron and Total Suspended Solids shall not be reduced to less than monthly. The Department may revoke the approval for reduced monitoring at any time upon notification to the permittee.

Reissuance or modification of this permit or reissuance or modification of the permittee's authorization to discharge shall not affect previous determinations regarding a permittee's monitoring frequency unless the Department provides notification in writing to the permittee.

PART I**Section A. Effluent Limitations And Monitoring Requirements**

- e. **Additional Sampling**
The Department may require the permittee to provide additional sampling and monitoring as deemed necessary to assure adequate operation of the treatment system(s) and/or that Michigan's Water Quality Standards are met during the period of discharge.
- f. **Water Treatment Additives**
This permit does not authorize the discharge of water additives other than chlorine and approved dechlorinating reagents without approval from the Department. Approval of water additives is authorized under separate correspondence. Water additives include any material that is added to water used at the facility or to a wastewater generated by the facility to condition or treat the water. In the event a permittee proposes to discharge water additives, including an increased discharge concentration of a previously approved water additive, the permittee shall submit a request to the Department for approval. See Part I.A. 10. for information on requesting water treatment additive use.

PART I

Section A. Effluent Limitations And Monitoring Requirements

2. Final Effluent Limitations for Membrane Filtration Facilities

During the period beginning on the effective date of this permit and the effective date of an individual Certificate of Coverage, and lasting until the expiration of this permit or termination of the individual Certificate of Coverage, the permittee is authorized to discharge wastewaters associated with the production of potable water to the surface waters of the state of Michigan. Such discharge shall be limited and monitored by the permittee as specified below.

Parameter	Maximum Limits for Quantity or Loading			Maximum Limits for Quality or Concentration			Frequency of Analysis	Sample Type
	Monthly	Daily	Units	Monthly	Daily	Units		
Retained Self-Monitoring Requirements, see Part II.C.3.								
Flow	(report)	(report)	MGD	---	---	---	Daily	Report Total Daily Flow
Total Suspended Solids	---	---	---	30	50	mg/l	Weekly	Grab
Chloride	---	---	---	---	(report)	mg/l	Monthly	Grab
Sulfate	---	---	---	---	(report)	mg/l	Monthly	Grab
Outfall Observation	(report)	---	yes/no	---	---	---	Weekly	Visual
pH	---	---	---	Minimum	Maximum	S.U.	See d. below	Grab
				Daily	Daily			
				6.5	9.0			

- a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.
- b. Monitoring Location
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken of the discharge prior to mixing with the waters of the state of Michigan.
- c. Outfall Observation
Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported within 24 hours to the Department followed with a written report within five (5) days detailing the findings of the investigation and the steps taken to correct the condition.
- d. pH Monitoring
pH is not required monitoring for Membrane Filtration Facilities except once per discharge from the treated caustic/acid wash waste treatment system.

PART I**Section A. Effluent Limitations And Monitoring Requirements**

- e. **Monitoring Frequency Reduction for Total Suspended Solids, Chloride, and Sulfate**
After the collection of three months of data, the permittee may request, in writing, Department approval of a reduction in monitoring frequency for Total Suspended Solids, Chloride, or Sulfate. This request shall contain an explanation as to why the reduced monitoring is appropriate and the summary of the collected data. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency indicated in Part I.A.2. of this permit. The monitoring frequency for Total Suspended Solids shall not be reduced to less than monthly. The monitoring frequency for Chloride or Sulfate may be eliminated. The Department may revoke the approval for reduced monitoring at any time upon notification to the permittee.

Reissuance or modification of this permit or reissuance or modification of the permittee's authorization to discharge shall not affect previous determinations regarding a permittee's monitoring frequency unless the Department provides notification in writing to the permittee.
- f. **Water Treatment Additives**
This permit does not authorize the discharge of water additives other than chlorine and approved dechlorinating reagents without approval from the Department. Approval of water additives is authorized under separate correspondence. Water additives include any material that is added to water used at the facility or to a wastewater generated by the facility to condition or treat the water. Additives used in water treatment for a public water supply must be approved under the requirements of the Michigan Safe Drinking Water Act (Act 399, PA 1976, as amended). In the event a permittee proposes to discharge water additives, including an increased discharge concentration of a previously approved water additive, the permittee shall submit a request to the Department for approval. See Part I.A.10. for information on requesting water treatment additive use.
- g. **Additional Sampling**
The Department may require the permittee to provide additional sampling and monitoring as deemed necessary to assure adequate operation of the treatment system(s) and/or that Michigan's Water Quality Standards are met during the period of discharge.

PART I**Section A. Effluent Limitations And Monitoring Requirements****3. Final Effluent Limitations for Chemical Precipitation/Filtration and Coagulation/Filtration Facilities**

During the period beginning on the effective date of this permit and the effective date of an individual Certificate of Coverage, and lasting until the expiration of this permit or termination of the individual Certificate of Coverage, the permittee is authorized to discharge wastewaters associated with the production of potable water to the surface waters of the state of Michigan. Such discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Frequency of Analysis</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
<u>Retained Self-Monitoring Requirements, see Part II.C.3.</u>								
Flow	(report)	(report)	MGD	—	—	—	Daily	Report Total Daily Flow
Total Suspended Solids	—	—	—	30	50	mg/l	Weekly	Grab
Outfall Observation	(report)	—	yes/no	—	—	—	Weekly	Visual
pH	—	—	—	<u>Minimum</u>	<u>Maximum</u>	S.U.	Weekly	Grab
				<u>Daily</u>	<u>Daily</u>			
				6.5	See e. below			

- a. **Narrative Standard**
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.
- b. **Monitoring Location**
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken of the discharge prior to mixing with the waters of the state of Michigan.
- c. **Outfall Observation**
Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported within 24 hours to the Department followed with a written report within five (5) days detailing the findings of the investigation and the steps taken to correct the condition.
- d. **Monitoring Frequency Reduction for Total Suspended Solids**
After the collection of three months of data, the permittee may request, in writing, Department approval of a reduction in monitoring frequency for Total Suspended Solids. This request shall contain an explanation as to why the reduced monitoring is appropriate and the summary of the collected data. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency indicated in Part I.A.3. of this permit. The monitoring frequency for Total Suspended Solids shall not be reduced to less than monthly. The Department may revoke the approval for reduced monitoring at any time upon notification to the permittee.

Reissuance or modification of this permit or reissuance or modification of the permittee's authorization to discharge shall not affect previous determinations regarding a permittee's monitoring frequency unless the Department provides notification in writing to the permittee.

PART I**Section A. Effluent Limitations And Monitoring Requirements**

- e. **pH Limitation**
The daily maximum pH effluent limitation is 9.0 S.U. for all wastewater discharges unless it has been determined by the Department that a higher limitation will not cause a violation of Water Quality Standards. The higher effluent limitation, if approved by the Department, will be identified in the Certificate of Coverage.
- f. **Water Treatment Additives**
This permit does not authorize the discharge of water additives other than chlorine and approved dechlorinating reagents without approval from the Department. Approval of water additives is authorized under separate correspondence. Water additives include any material that is added to water used at the facility or to a wastewater generated by the facility to condition or treat the water. Additives used in water treatment for a public water supply must be approved under the requirements of the Michigan Safe Drinking Water Act (Act 399, PA 1976, as amended). In the event a permittee proposes to discharge water additives, including an increased discharge concentration of a previously approved water additive, the permittee shall submit a request to the Department for approval. See Part I A.10. for information on requesting water treatment additive use.
- g. **Additional Sampling**
The Department may require the permittee to provide additional sampling and monitoring as deemed necessary to assure adequate operation of the treatment system(s) and/or that Michigan's Water Quality Standards are met during the period of discharge.

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Section A. Effluent Limitations And Monitoring Requirements

4. Final Effluent Limitations for Arsenic Removal Facilities

During the period beginning on the effective date of this permit and the effective date of an individual Certificate of Coverage, and lasting until the expiration of this permit or termination of the individual Certificate of Coverage, the permittee is authorized to discharge wastewaters associated with the production of potable water to the surface waters of the state of Michigan. Such discharge shall be limited and monitored by the permittee as specified below.

Parameter	Maximum Limits for Quantity or Loading			Maximum Limits for Quality or Concentration			Frequency of Analysis	Sample Type
	Monthly	Daily	Units	Monthly	Daily	Units		
	Retained Self-Monitoring Requirements, see Part II.C.3.							
Flow	(report)	(report)	MGD	---	---	---	Daily	Report Total Daily Flow
Total Suspended Solids	---	---	---	30	50	mg/l	Quarterly	Grab
Total Iron	---	---	---	5.0	---	mg/l	Quarterly	Grab
Total Arsenic	---	---	---	(report)	(report)	ug/l	Quarterly	Grab
Outfall Observation	(report)	---	yes/no	---	---	---	Weekly	Visual

- a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.
- b. Monitoring Requirements
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken of the discharge prior to mixing with the waters of the state of Michigan. Quarterly samples shall be taken in January, April, July and October.
- c. Outfall Observation
Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported within 24 hours to the Department followed with a written report within five (5) days detailing the findings of the investigation and the steps taken to correct the condition.
- d. Total Arsenic Analysis
To determine total arsenic, a quantification level of 1.0 ug/l shall be used unless a higher level is appropriate because of sample matrix interference. Justification for higher quantification levels shall be submitted to the Department within 30 days of such determination. Upon approval of the Department, the permittee may use alternate analytical methods (for parameters with methods specified in Title 40 of the Code of Federal Regulations, Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants, the alternate methods are restricted to those listed in 40 CFR 136).

PART I**Section A. Effluent Limitations And Monitoring Requirements****e. Water Treatment Additives**

This permit does not authorize the discharge of water additives other than chlorine and approved dechlorinating reagents without approval from the Department. Approval of water additives is authorized under separate correspondence. Water additives include any material that is added to water used at the facility or to a wastewater generated by the facility to condition or treat the water. Additives used in water treatment for a public water supply must be approved under the requirements of the Michigan Safe Drinking Water Act (Act 399, PA 1976, as amended). In the event a permittee proposes to discharge water additives, including an increased discharge concentration of a previously approved water additive, the permittee shall submit a request to the Department for approval. See Part I.A 10. for information on requesting water treatment additive use.

f. Additional Sampling

The Department may require the permittee to provide additional sampling and monitoring as deemed necessary to assure adequate operation of the treatment system(s) and/or that Michigan's Water Quality Standards are met during the period of discharge.

PART I

Section A. Effluent Limitations And Monitoring Requirements

5. Final Effluent Limitations for Miscellaneous Waste Streams

During the period beginning on the effective date of this permit and the effective date of an individual Certificate of Coverage, and lasting until the expiration of this permit or termination of the individual Certificate of Coverage, the permittee is authorized to discharge wastewaters associated with the production of potable waters to the surface waters of the state of Michigan. Such discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Frequency of Analysis</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
<u>Retained Self-Monitoring Requirements, see Part II.C.3.</u>								
Flow	(report)	(report)	MGD	---	---	---	Daily	Report Total Daily Flow
Oil & Grease	---	---	---	(report)	(report)	mg/l	as requested	Grab
Total Suspended Solids	---	---	---	(report)	(report)	mg/l	as requested	Grab
Outfall Observation	(report)	---	yes/no	---	---	---	Weekly	Visual

a. Narrative Standard

The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.

b. Monitoring Location

Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken of the discharge prior to mixing with the waters of the state of Michigan.

c. Outfall Observation

Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported within 24 hours to the Department followed with a written report within five (5) days detailing the findings of the investigation and the steps taken to correct the condition.

d. Additional Sampling

The Department may require the permittee to provide additional sampling and monitoring as deemed necessary to assure adequate operation of the treatment system(s) and/or that that Michigan's Water Quality Standards are met during the period of discharge.

e. Water Treatment Additives

This permit does not authorize the discharge of water additives other than chlorine and approved dechlorinating reagents without approval from the Department. Approval of water additives is authorized under separate correspondence. Water additives include any material that is added to water used at the facility or to a wastewater generated by the facility to condition or treat the water. Additives used in water treatment for a public water supply must be approved under the requirements of the Michigan Safe Drinking Water Act (Act 399, PA 1976, as amended). In the event a permittee proposes to discharge water additives, including an increased discharge concentration of a previously approved water additive, the permittee shall submit a request to the Department for approval. See Part I.A.10. for information on requesting water treatment additive use.

PART I**Section A. Effluent Limitations And Monitoring Requirements****6. Final Effluent Limitations for Chlorinated Discharges**

If the permittee discharges chlorinated wastewater as part of the potable water treatment process, the following final effluent limitations shall apply, and the discharge shall be controlled and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Frequency of Analysis</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
<u>Retained Self-Monitoring Requirements, see Part II.C.3.</u>								
Total Residual Chlorine (TRC)								
<u>Discharge Mode</u>								
Continuous (greater than 160 min/day)	---	---	---	---	38	ug/l	Weekly	Grab
Intermittent (less than/equal to 160 min/day)		---	---	---	200	ug/l	Weekly	Grab
TRC Discharge Time	---	---	---	---	(report)	min/day	Weekly	Report Total Discharge Time

- a Total Residual Chlorine
Total Residual Chlorine (TRC) shall be analyzed for using EPA Method 330.1 or Orion Electrode Model 97-70 (other analytical methods specified in 40 CFR 136 may be used upon approval of the Department). If chlorine discharge is intermittent, TRC monitoring is only required during periods of chlorine use and subsequent discharge.

The permittee shall enter *G on the Discharge Monitoring Report for the TRC discharge modes not being used.

The permittee may use dechlorination techniques to achieve the applicable TRC limitations, using sodium thiosulfate, sodium sulfite, sodium bisulfite, or other dechlorinating reagents approved by the Department. The quantity of reagent(s) used shall be limited to 1.5 times the stoichiometric amount of applied chlorine.

PART I

Section A. Effluent Limitations And Monitoring Requirements

7. Final Effluent Limitation for Total Phosphorus

If the Department determines it is necessary to control phosphorus discharges to protect downstream water quality, the discharge shall be limited and monitored by the permittee as specified below. Such determination and the effective date of the limitation will be indicated on the Certificate of Coverage. The effective date of the limitation to be no greater than five years after the effective date of the Certificate of Coverage.

Parameter	Maximum Limits for Quantity or Loading			Maximum Limits for Quality or Concentration			Frequency of Analysis	Sample Type
	Monthly	Daily	Units	Monthly	Daily	Units		
<u>Retained Self-Monitoring Requirements, see Part II.C.3.</u>								
Total Phosphorus	—	—	—	1.0		mg/l	Weekly	Grab

a. Monitoring Frequency Reduction for Total Phosphorus

After the collection of three months of data, the permittee may request, in writing, Department approval of a reduction in monitoring frequency for Total Phosphorus. This request shall contain an explanation as to why the reduced monitoring is appropriate and the summary of the collected data. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency indicated in Part I A.7. of this permit. The monitoring frequency for Total Phosphorus shall not be reduced to less than quarterly. The Department may revoke the approval for reduced monitoring at any time upon notification to the permittee.

Reissuance or modification of this permit or reissuance or modification of the permittee's authorization to discharge shall not affect previous determinations regarding a permittee's monitoring frequency unless the Department provides notification in writing to the permittee.

PART I**Section A. Effluent Limitations And Monitoring Requirements****8. Final Effluent Limitation for Total Arsenic**

If the Department determines it necessary to control arsenic discharges to protect downstream water quality, the discharge shall be limited and monitored by the permittee as specified below. Such determination and the effective date of the limitation will be indicated on the Certificate of Coverage. The effective date of the limitation to be no greater than five years after the effective date of the Certificate of Coverage.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Frequency of Analysis</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
<u>Retained Self-Monitoring Requirements, see Part II.C.3.</u>								
Total Arsenic	---	---	---	150	680	ug/l	Weekly	Composite

a. Monitoring Frequency Reduction for Total Arsenic

After the collection of three months of data, the permittee may request, in writing, Department approval of a reduction in monitoring frequency for Total Arsenic. This request shall contain an explanation as to why the reduced monitoring is appropriate and the summary of the collected data. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency indicated in Part I.A.7 of this permit. The monitoring frequency for Total Arsenic shall not be reduced to less than quarterly. The Department may revoke the approval for reduced monitoring at any time upon notification to the permittee.

Reissuance or modification of this permit or reissuance or modification of the permittee's authorization to discharge shall not affect previous determinations regarding a permittee's monitoring frequency unless the Department provides notification in writing to the permittee.

b. Composite sample

For the purposes of compliance with this permit a composite sample shall be defined as a sample consisting of equal flow weighted volume grab samples collected at equal intervals which are representative of the discharge or other type of composite sample as approved by the Department.

9. Intake Screen Backwash

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge intake screen backwash from surface water withdrawal plants to the surface waters of the state of Michigan. The permittee shall collect and remove debris accumulated on intake trash bars and dispose of such material on land in an appropriate manner.

PART I

Section A. Effluent Limitations And Monitoring Requirements

10. Request for Discharge of Water Treatment Additives

In the event a permittee proposes to discharge water additives, the permittee shall submit a request to discharge water additives to the Department for approval. Such requests shall be sent to the Surface Water Assessment Section, Water Bureau, Department of Environmental Quality, P.O. Box 30273, Lansing, Michigan 48909, with a copy to the Department contact listed on the Certificate of Coverage. Instructions to submit a request electronically may be obtained via the Internet [<http://www.michigan.gov/deq> and on the left side of the screen click on (1) Water, (2) Water Quality Monitoring, (3) Assessment of Michigan Waters; then (4) click on the Water Treatment Additive List which is under the Information banner]. Written approval from the Surface Water Assessment Section to discharge such additives at specified levels shall be obtained prior to discharge by the permittee. Additional monitoring and reporting may be required as a condition for the approval to discharge the additive.

A request to discharge water additives shall include all of the following water additive usage and discharge information:

- a. Material Safety Data Sheet;
- b. the proposed water additive discharge concentration;
- c. the discharge frequency (i.e., number of hours per day and number of days per year);
- d. the monitoring point from which the product is to be discharged;
- e. the type of removal treatment, if any, that the water additive receives prior to discharge;
- f. product function (i.e. microbiocide, flocculant, etc.);
- g. a 48-hour LC_{50} or EC_{50} for a North American freshwater planktonic crustacean (either *Ceriodaphnia* sp., *Daphnia* sp., or *Simocephalus* sp.); and
- h. the results of a toxicity test for one other North American freshwater aquatic species (other than a planktonic crustacean) that meets a minimum requirement of Rule 323.1057(2) of the Water Quality Standards.

Prior to submitting the request, the permittee may contact the Surface Water Assessment Section by telephone at 517-335-1180 or via the Internet at the address given above to determine if the Department has the product toxicity data required by items g. and h. above. If the Department has the data, the permittee will not need to submit product toxicity data.

Water treatment additives which are approved under ANSI/NSF Standard 60 "Drinking Water Treatment Chemicals" are pre-approved for use for facilities issued a Certificate of Coverage authorized by this permit

11. Facility Contact

The "Facility Contact" was specified in the application. The permittee may replace the facility contact at any time, and shall notify the Department in writing within 10 days after replacement (including the name, address and telephone number of the new facility contact).

- a. The facility contact shall be (or a duly authorized representative of this person):
 - for a corporation, a principal executive officer of at least the level of vice president, or a designated representative, if the representative is responsible for the overall operation of the facility from which the discharge described in the permit application or other NPDES form originates,
 - for a partnership, a general partner,

PART I

Section A. Effluent Limitations And Monitoring Requirements

- for a sole proprietorship, the proprietor, or
 - for a municipal, state, or other public facility, either a principal executive officer, the mayor, village president, city or village manager or other duly authorized employee.
- b. A person is a duly authorized representative only if:
- the authorization is made in writing to the Department by a person described in paragraph a. of this section; and
 - the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the facility (a duly authorized representative may thus be either a named individual or any individual occupying a named position).

Nothing in this section obviates the permittee from properly submitting reports and forms as required by law.

12. Expiration and Reissuance

On or before October 1, 2014, a permittee seeking continued authorization to discharge under this permit beyond the permit's expiration date shall submit to the Department a written request containing such information, forms and fees as required by the Department. Without an adequate request, a permittee's authorization to discharge will expire on April 1, 2015. With an adequate request, a permittee shall continue to be subject to the terms and conditions of the expired permit until the Department takes action on the request unless this permit is terminated or revoked.

If this permit is terminated or revoked, all authorizations to discharge under the permit shall expire on the date of termination or revocation.

If this permit is modified, the Department will notify the permittee of any required action. Without an adequate response, a permittee's authorization to discharge will terminate on the effective date of the modified permit. With an adequate response, a permittee shall be subject to the terms and conditions of the modified permit on the effective date of the modified permit unless the Department notifies the permittee otherwise.

If a discharge is terminated, the permittee shall request termination of discharge authorization.

13. Requirement to Obtain Individual Permit

The Department may require any person who is authorized to discharge by a Certificate of Coverage and this permit, to apply for and obtain an individual NPDES permit if any of the following circumstances apply:

- a. the discharge is a significant contributor to pollution as determined by the Department on a case-by-case basis;
- b. the discharger is not complying or has not complied with the conditions of the permit;
- c. a change has occurred in the availability of demonstrated technology or practices for the control or abatement of waste applicable to the point source discharge;
- d. effluent standards and limitations are promulgated for point source discharges subject to this permit; and
- e. the Department determines that the criteria under which the permit was issued no longer apply.

Any person may request the Department to take action pursuant to the provisions of Rule 2191 (Rule 323.2191 of the Michigan Administrative Code)

PART II

Section A. Definitions

This list of definitions may include terms not applicable to this permit.

Acute toxic unit (TU_A) means 100/LC₅₀ where the LC₅₀ is determined from a whole effluent toxicity (WET) test which produces a result that is statistically or graphically estimated to be lethal to 50% of the test organisms.

Bioaccumulative chemical of concern (BCC) means a chemical which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor of more than 1000 after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation. The human health bioaccumulation factor shall be derived according to R 323.1057(5). Chemicals with half-lives of less than 8 weeks in the water column, sediment, and biota are not BCCs. The minimum bioaccumulation concentration factor (BAF) information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the biota-sediment accumulation factor (BSAF) methodology. The minimum BAF information needed to define an inorganic chemical as a BCC, including an organometal, is either a field-measured BAF or a laboratory-measured bioconcentration factor (BCF). The BCCs to which these rules apply are identified in Table 5 of R 323.1057 of the Water Quality Standards.

Biosolids are the solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. This includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

Chronic toxic unit (TU_C) means 100/MATC or 100/IC₂₅, where the maximum acceptable toxicant concentration (MATC) and IC₂₅ are expressed as a percent effluent in the test medium.

Class B Biosolids refers to material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with the Part 24 Rules. Processes include aerobic digestion, composting, anaerobic digestion, lime stabilization and air drying.

Daily concentration is the sum of the concentrations of the individual samples of a parameter divided by the number of samples taken during any calendar day. If the parameter concentration in any sample is less than the quantification limit, regard that value as zero when calculating the daily concentration. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations (except for pH and dissolved oxygen). When required by the permit, report the maximum calculated daily concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the Discharge Monitoring Reports (DMRs).

Deleted: ¶

For pH, report the maximum value of any individual sample taken during the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs and the minimum value of any individual sample taken during the month in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. For dissolved oxygen, report the minimum concentration of any individual sample in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Daily loading is the total discharge by weight of a parameter discharged during any calendar day. This value is calculated by multiplying the daily concentration by the total daily flow and by the appropriate conversion factor. The daily loading will be used to determine compliance with any maximum daily loading limitations. When required by the permit, report the maximum calculated daily loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMRs.

Department means the Michigan Department of Environmental Quality.

Detection Level means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

PART II

Section A. Definitions

EC₅₀ means a statistically or graphically estimated concentration that is expected to cause 1 or more specified effects in 50% of a group of organisms under specified conditions.

Fecal coliform bacteria monthly is the geometric mean of the samples collected in a calendar month (or 30 consecutive days). The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMRs.

Fecal coliform bacteria 7-day is the geometric mean of the samples collected in any 7-day period. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Flow Proportioned sample is a composite sample with the sample volume proportional to the effluent flow.

Grab sample is a single sample taken at neither a set time nor flow.

IC₂₅ means the toxicant concentration that would cause a 25% reduction in a nonquantal biological measurement for the test population.

Interference is a discharge which, alone or in conjunction with a discharge or discharges from other sources, both: 1) inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and 2) therefore, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or, of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act. [This definition does not apply to sample matrix interference.]

Land Application means spraying or spreading biosolids or a biosolids derivative onto the land surface, injecting below the land surface, or incorporating into the soil so that the biosolids or biosolids derivative can either condition the soil or fertilize crops or vegetation grown in the soil.

LC₅₀ means a statistically or graphically estimated concentration that is expected to be lethal to 50% of a group of organisms under specified conditions.

Maximum acceptable toxicant concentration (MATC) means the concentration obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration that did not cause the occurrence of a specific adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specific adverse effect and above which all tested concentrations caused such an occurrence.

MGD means million gallons per day.

Monthly frequency of analysis refers to a calendar month. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

Monthly concentration is the sum of the daily concentrations determined during a reporting month (or 30 consecutive days) divided by the number of daily concentrations determined. The calculated monthly concentration will be used to determine compliance with any maximum monthly concentration limitations. When required by the permit, report the calculated monthly concentration in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMRs.

PART II

Section A. Definitions

For minimum percent removal requirements, the monthly influent concentration and the monthly effluent concentration shall be determined. The calculated monthly percent removal, which is equal to 100 times the quantity $[1 \text{ minus the quantity (monthly effluent concentration divided by the monthly influent concentration)}]$, shall be reported in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Monthly loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined in the reporting month (or 30 consecutive days). The calculated monthly loading will be used to determine compliance with any maximum monthly loading limitations. When required by the permit, report the calculated monthly loading in the "AVERAGE" column under "QUANTITY OR LOADING" on the DMRs.

National Pretreatment Standards are the regulations promulgated by or to be promulgated by the Federal Environmental Protection Agency pursuant to Section 307(b) and (c) of the Federal Act. The standards establish nationwide limits for specific industrial categories for discharge to a POTW.

No observed adverse effect level (NOAEL) means the highest tested dose or concentration of a substance which results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

Noncontact Cooling Water is water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product or finished product.

Nondomestic user is any discharger to a POTW that discharges wastes other than or in addition to water-carried wastes from toilet, kitchen, laundry, bathing or other facilities used for household purposes.

Partially treated sewage is any sewage, sewage and storm water, or sewage and wastewater, from domestic or industrial sources that is treated to a level less than that required by the permittee's National Pollutant Discharge Elimination System permit, or that is not treated to national secondary treatment standards for wastewater, including discharges to surface waters from retention treatment facilities.

Pretreatment is reducing the amount of pollutants, eliminating pollutants, or altering the nature of pollutant properties to a less harmful state prior to discharge into a public sewer. The reduction or alteration can be by physical, chemical, or biological processes, process changes, or by other means. Dilution is not considered pretreatment unless expressly authorized by an applicable National Pretreatment Standard for a particular industrial category.

POTW is a publicly owned treatment works.

Quantification level means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant.

Quarterly frequency of analysis refers to a three month period, defined as January through March, April through June, July through September, and October through December. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

Regional Administrator is the Region 5 Administrator, U.S. EPA, located at R-19J, 77 W. Jackson Blvd., Chicago, Illinois 60604.

Significant industrial user is a nondomestic user that: 1) is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; or 2) discharges an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the permittee as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's treatment plant operation or violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

PART II

Section A. Definitions

Significant Materials Significant Materials means any material which could degrade or impair water quality, including but not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; hazardous substances designated under Section 101(14) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 40 CFR 372.65); any chemical the facility is required to report pursuant to Section 313 of Emergency Planning and Community Right-to-Know Act (EPCRA); polluting materials as identified under the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code); Hazardous Wastes as defined in Part 111 of the Michigan Act; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Tier I value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier I toxicity database.

Tier II value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier II toxicity database.

Total Maximum Daily Loads (TMDL) are required by the Federal Act for waterbodies that do not meet Water Quality Standards. TMDLs represent the maximum daily load of a pollutant that a waterbody can assimilate and meet Water Quality Standards and an allocation of that load among point sources, nonpoint sources, and a margin of safety.

Toxicity Reduction Evaluation (TRE) means a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

Water Quality Standards means the Part 4 Water Quality Standards promulgated pursuant to Part 31 of Act No. 451 of the Public Acts of 1994, as amended, being Rules 323.1041 through 323.1117 of the Michigan Administrative Code.

Weekly frequency of analysis refers to a calendar week which begins on Sunday and ends on Saturday. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

Yearly frequency of analysis refers to a calendar year beginning on January 1 and ending on December 31. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

24-Hour Composite sample is a flow proportioned composite sample consisting of hourly or more frequent portions that are taken over a 24-hour period.

3-Portion Composite sample is a sample consisting of three equal volume grab samples collected at equal intervals over an 8-hour period.

7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days in a reporting month divided by the number of daily concentrations determined. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

7-day loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during any 7 consecutive days in a reporting month. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations. When required by the permit, report the maximum calculated 7-day loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMRs.

PART II**Section B. Monitoring Procedures****1. Representative Samples**

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to Section 304(h) of the Federal Act (40 CFR Part 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants), unless specified otherwise in this permit. Requests to use test procedures not promulgated under 40 CFR Part 136 for pollutant monitoring required by this permit shall be made in accordance with the Alternate Test Procedures regulations specified in 40 CFR 136.4. These requests shall be submitted to the Chief of the Permits Section, Water Bureau, Michigan Department of Environmental Quality, P.O. Box 30273, Lansing, Michigan, 48909-7773. The permittee may use such procedures upon approval.

The permittee shall periodically calibrate and perform maintenance procedures on all analytical instrumentation at intervals to ensure accuracy of measurements. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Control/Quality Assurance program.

3. Instrumentation

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring instrumentation at intervals to ensure accuracy of measurements.

4. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information: 1) the exact place, date, and time of measurement or sampling; 2) the person(s) who performed the measurement or sample collection; 3) the dates the analyses were performed; 4) the person(s) who performed the analyses; 5) the analytical techniques or methods used; 6) the date of and person responsible for equipment calibration; and 7) the results of all required analyses.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Department.

PART II**Section C. Reporting Requirements****1. Start-up Notification**

If the permittee will not discharge during the first 60 days following the effective date of the facility's Certificate of Coverage, the permittee shall notify the Department within 14 days following the effective date of the Certificate of Coverage, and then 60 days prior to the commencement of the discharge.

2. Submittal Requirements for Self-Monitoring Data

Part 31 of Act 451 of 1994, as amended, specifically Section 324.3110(3) and Rule 323.2155(2) of Part 21 allows the department to specify the forms to be utilized for reporting the required self-monitoring data. Unless instructed on the effluent limitations page to conduct "Retained Self Monitoring" the permittee shall submit self-monitoring data via the Michigan DEQ Electronic Environmental Discharge Monitoring Reporting (e2-DMR) system.

The permittee shall utilize the information provided on the e2-Reporting website @ <https://secure1.state.mi.us/e2rs/> to access and submit the electronic forms. Both monthly summary and daily data shall be submitted to the department no later than the 20th day of the month following each month of the authorized discharge period(s).

3. Retained Self-Monitoring Requirements

If instructed on the effluent limits page (or otherwise authorized by the Department in accordance with the provisions of this permit) to conduct retained self-monitoring, the permittee shall maintain a year-to-date log of retained self-monitoring results and, upon request, provide such log for inspection to the staff of the Department (Department as defined on the Certificate of Coverage). Retained self-monitoring results are public information and shall be promptly provided to the public upon written request from the public.

The permittee shall certify, in writing, to the Department, on or before January 10th of each year, that: 1) all retained self-monitoring requirements have been complied with and a year-to-date log has been maintained; and 2) the application on which this permit is based still accurately describes the discharge. With this annual certification, the permittee shall submit a summary of the previous year's monitoring data. The summary shall include maximum values for samples to be reported as daily maximums and/or monthly maximums and minimum values for any daily minimum samples.

Retained self-monitoring may be denied to a permittee by notification in writing from the Department. In such cases, the permittee shall submit self-monitoring data in accordance with Part II.C.2, above. Such a denial may be rescinded by the Department upon written notification to the permittee.

Reissuance or modification of this permit or reissuance or modification of an individual permittee's authorization to discharge shall not affect previous approval or denial for retained self-monitoring unless the Department provides notification in writing to the permittee.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report. Such increased frequency shall also be indicated.

Monitoring required pursuant to Part 41 of the Michigan Act or Rule 35 of the Mobile Home Park Commission Act (Act 96 of the Public Acts of 1987) for assurance of proper facility operation shall be submitted as required by the Department.

PART II**Section C. Reporting Requirements****5. Compliance Dates Notification**

Within 14 days of every compliance date specified in this permit, the permittee shall submit a written notification to the Department indicating whether or not the particular requirement was accomplished. If the requirement was not accomplished, the notification shall include an explanation of the failure to accomplish the requirement, actions taken or planned by the permittee to correct the situation, and an estimate of when the requirement will be accomplished. If a written report is required to be submitted by a specified date and the permittee accomplishes this, a separate written notification is not required.

6. Noncompliance Notification

Compliance with all applicable requirements set forth in the Federal Act, Parts 31 and 41 of the Michigan Act, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

- a. 24-hour reporting - Any noncompliance which may endanger health or the environment (including maximum daily concentration discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the noncompliance. A written submission shall also be provided within five (5) days.
- b. other reporting - The permittee shall report, in writing, all other instances of noncompliance not described in a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

Written reporting shall include: 1) a description of the discharge and cause of noncompliance; and 2) the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

7. Spill Notification

The permittee shall immediately report any release of any polluting material which occurs to the surface waters or groundwaters of the state, unless the permittee has determined that the release is not in excess of the threshold reporting quantities specified in the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code), by calling the Department at the number indicated in the Certificate of Coverage, or if the notice is provided after regular working hours call the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706 (calls from out-of-state dial 1-517-373-7660).

Within ten (10) days of the release, the permittee shall submit to the Department a full written explanation as to the cause of the release, the discovery of the release, response (clean-up and/or recovery) measures taken, and preventative measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

PART II**Section C. Reporting Requirements****8. Upset Noncompliance Notification**

If a process "upset" (defined as an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee) has occurred, the permittee who wishes to establish the affirmative defense of upset, shall notify the Department by telephone within 24-hours of becoming aware of such conditions; and within five (5) days, provide in writing, the following information:

- a. that an upset occurred and that the permittee can identify the specific cause(s) of the upset;
- b. that the permitted wastewater treatment facility was, at the time, being properly operated; and
- c. that the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit.

In any enforcement proceedings, the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

9. Bypass Prohibition and Notification

- a. Bypass Prohibition - Bypass is prohibited unless
 - 1) bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - 2) there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass; and
 - 3) the permittee submitted notices as required under 9.b. or 9.c. below.
- b. Notice of Anticipated Bypass - If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least ten (10) days before the date of the bypass, and provide information about the anticipated bypass as required by the Department. The Department may approve an anticipated bypass, after considering its adverse effects, if it will meet the three (3) conditions listed in 9.a. above.
- c. Notice of Unanticipated Bypass - The permittee shall submit notice to the Department of an unanticipated bypass by calling the Department at the number indicated in the Certificate of Coverage (if the notice is provided after regular working hours, use the following number: 1-800-292-4706) as soon as possible, but no later than 24 hours from the time the permittee becomes aware of the circumstances.
- d. Written Report of Bypass - A written submission shall be provided within five (5) working days of commencing any bypass to the Department, and at additional times as directed by the Department. The written submission shall contain a description of the bypass and its cause; the period of bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass; and other information as required by the Department.

PART II**Section C. Reporting Requirements**

- e. Bypass Not Exceeding Limitations – The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of 9 a., 9 b., 9 c., and 9 d., above. This provision does not relieve the permittee of any notification responsibilities under Part II.C.10. of this permit.
- f. Definitions
 - 1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.
 - 2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

10. Notification of Changes in Discharge

The permittee shall notify the Department, in writing, within 10 days of knowing, or having reason to believe, that any activity or change has occurred or will occur which would result in the discharge of: 1) detectable levels of chemicals on the current Michigan Critical Materials Register, priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, or the Pollutants of Initial Focus in the Great Lakes Water Quality Initiative specified in 40 CFR 132.6, Table 6, which were not acknowledged in the application or listed in the application at less than detectable levels; 2) detectable levels of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information; or 3) any chemical at levels greater than five times the average level reported in the complete application (see the Certificate of Coverage for the date(s) the complete application was submitted). Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the compliance schedules.

11. Changes in Facility Operations

Any anticipated action or activity, including but not limited to facility expansion, production increases, or process modification, which will result in new or increased loadings of pollutants to the receiving waters must be reported to the Department by a) submission of an increased use request (application) and all information required under Rule 323.1098 (Antidegradation) of the Water Quality Standards or b) by notice if the following conditions are met: 1) the action or activity will not result in a change in the types of wastewater discharged or result in a greater quantity of wastewater than currently authorized by this permit; 2) the action or activity will not result in violations of the effluent limitations specified in this permit; 3) the action or activity is not prohibited by the requirements of Part II.C.12., and 4) the action or activity will not require notification pursuant to Part II.C.10. Following such notice, the permit may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

12. Bioaccumulative Chemicals of Concern (BCC)

Consistent with the requirements of Rules 323.1098 and 323.1215 of the Michigan Administrative Code, the permittee is prohibited from undertaking any action that would result in a lowering of water quality from an increased loading of a BCC unless an increased use request and antidegradation demonstration have been submitted and approved by the Department.

PART II**Section C. Reporting Requirements****13. Transfer of Ownership or Control**

In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the permittee shall submit to the Department 30 days prior to the actual transfer of ownership or control a written agreement between the current permittee and the new permittee containing: 1) the legal name and address of the new owner; 2) a specific date for the effective transfer of permit responsibility, coverage and liability; and 3) a certification of the continuity of or any changes in operations, wastewater discharge, or wastewater treatment.

If the new permittee is proposing changes in operations, wastewater discharge, or wastewater treatment, the Department may propose modification of this permit in accordance with applicable laws and rules.

PART II**Section D. Management Responsibilities****1. Duty to Comply**

All discharges authorized herein shall be consistent with the terms and conditions of this permit and the facility's Certificate of Coverage (COC). The discharge of any pollutant identified in this permit and/or the facility's COC more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit and the facility's COC. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit or the facility's COC constitutes a violation of the Michigan Act and/or the Federal Act and constitutes grounds for enforcement action; for COC termination, revocation and reissuance, or modification; or denial of an application for permit or COC renewal.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified at the appropriate level for the facility certification by the Department, as required by Sections 3110 and 4104 of the Michigan Act.

3. Facilities Operation

The permittee shall, at all times, properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures.

4. Power Failures

In order to maintain compliance with the effluent limitations of this permit and prevent unauthorized discharges, the permittee shall either:

- a. provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit; or
- b. upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, the permittee shall halt, reduce or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

5. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the surface waters or groundwaters of the state resulting from noncompliance with any effluent limitation specified in this permit including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

PART II**Section D. Management Responsibilities****6. Containment Facilities**

The permittee shall provide facilities for containment of any accidental losses of polluting materials in accordance with the requirements of the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code). For a Publicly Owned Treatment Work (POTW), these facilities shall be approved under Part 41 of the Michigan Act.

7. Waste Treatment Residues

Residuals (i.e. solids, sludges, biosolids, filter backwash, scrubber water, ash, grit, or other pollutants or wastes) removed from or resulting from treatment or control of wastewaters, including those that are generated during treatment or left over after treatment or control has ceased, shall be disposed of in an environmentally compatible manner and according to applicable laws and rules. These laws may include, but are not limited to, the Michigan Act, Part 31 for protection of water resources, Part 55 for air pollution control, Part 111 for hazardous waste management, Part 115 for solid waste management, Part 121 for liquid industrial wastes, Part 301 for protection of inland lakes and streams, and Part 303 for wetlands protection. Such disposal shall not result in any unlawful pollution of the air, surface waters or groundwaters of the state.

8. Right of Entry

The permittee shall allow the Department, any agent appointed by the Department or the Regional Administrator, upon the presentation of credentials:

- a. to enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and
- b. at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect process facilities, treatment works, monitoring methods and equipment regulated or required under this permit; and to sample any discharge of pollutants.

9. Availability of Reports

Except for data determined to be confidential under Section 308 of the Federal Act and Rule 2128 (Rule 323.2128 of the Michigan Administrative Code), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department and the Regional Administrator. As required by the Federal Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Act and Sections 3112, 3115, 4106 and 4110 of the Michigan Act.

PART II**Section E. Activities Not Authorized by This Permit****1. Discharge to the Groundwaters**

This permit does not authorize any discharge to the groundwaters. Such discharge may be authorized by a groundwater discharge permit issued pursuant to the Michigan Act.

2. Facility Construction

This permit does not authorize or approve the construction or modification of any physical structures or facilities. Approval for such construction for a POTW must be by permit issued under Part 41 of the Michigan Act. Approval for such construction for a mobile home park, campground or marina shall be from the Water Bureau, Michigan Department of Environmental Quality. Approval for such construction for a hospital, nursing home or extended care facility shall be from the Division of Health Facilities and Services, Michigan Department of Consumer and Industry Services upon request.

3. Civil and Criminal Liability

Except as provided in permit conditions on "Bypass" (Part II.C.9. pursuant to 40 CFR 122.41(m)), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond the permittee's control, such as accidents, equipment breakdowns, or labor disputes.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee may be subject under Section 311 of the Federal Act except as are exempted by federal regulations.

5. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Federal Act.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environmental Quality permits, or approvals from other units of government as may be required by law.



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

April 24, 2012

Mr. Brent Wright
City Of Flint - DPW
Flint Water Plant
4500 North Dort Highway
Flint, Michigan 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Stage 2 DDBP Monitoring Plan Approval

Your Stage 2 Disinfectants and Disinfection Byproduct (DDBP) Monitoring Plan was received and approved by this office. Please conduct routine monitoring in accordance with your Stage 2 DDBP Monitoring Plan as summarized below.

Monitor during the 3rd full week of May, August, November, and February at the following locations:

Sample For...	Site Code	Address of Sample Site
☒ TTHM ☒ HAA5	DBP1	3719 Davison Road
☒ TTHM ☒ HAA5	DBP2	3302 South Dort Highway
☒ TTHM ☒ HAA5	DBP3	6204 North Saginaw Street
☒ TTHM ☒ HAA5	DBP4	2501 Flushing Road

Please note that the monitoring requirements outlined in this letter are in addition to those specified in your 2012 Monitoring Schedule sent earlier this year. If your water supply qualifies for reduced monitoring in the future, you will be notified by the Department of Environmental Quality.

If you use a private laboratory, report the results to this office by the 10th of the month following the month in which results are received. Be sure to include WSSN and Site Code when submitting your results to ensure you receive proper credit for monitoring.

If you have questions, please contact us.

Sincerely,

Michael F. Prysby, P.E., District Engineer
Resource Management Division
prysbym@michigan.gov
517-335-6122

Adam Rosenthal, EQA
Resource Management Division
rosenthala@michigan.gov
517-335-6131

MFP:AR:JR

[Date]

[Contact]

[Address]

Dear [Last Name]:

SUBJECT: [Supply Name] – WSSN: 2310
 Stage 2 DDBP Monitoring Plan Approval

Your Stage 2 Disinfectants and Disinfection Byproduct (DDBP) Monitoring Plan was received and approved by this office. Please conduct routine monitoring as specified in your Stage 2 DDBP Monitoring Plan.

To summarize, you must conduct monitoring during the 3rd full week of July 12, July 12, July 12, July 12 at the following sampling locations:

Sample For ...	Site Code	Address of Sample Site
Dial	DBP 1	11111 Dunes Rd
Dial	DBP 2	11111 S. 1st Hwy
Dial	DBP 3	11111 N. 1st Hwy
Dial	DBP 4	11111 Flushing Rd

If your water supply qualifies for reduced monitoring in the future, you will be notified by the DEQ. Please note that the requirements outlined in this letter are in addition to the requirements specified in your 2012 Monitoring Schedule sent earlier this year.

Be certain to include WSSN and Site Code with your sample results to ensure you get proper credit for monitoring. If you use a private laboratory, report the results to this office by the 10th of the month following the month in which results are received.

If you have questions about the monitoring or reporting requirements, please contact me at _____.

Sincerely,

Xxxxxx
 xxxxxxx



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - RESOURCE MANAGEMENT DIVISION

MONITORING PLAN FOR COMMUNITY WATER SUPPLIES - DISINFECTANTS AND DISINFECTION BYPRODUCTS (DDBP)

Issued under authority of 1976 PA 399 and Administrative Rules, as amended. Administrative Rule R 325.10719i requires a water supply to develop a monitoring plan. This form is provided as a convenience to the water supply to develop the plan.

Water Supply Information

<u>CITY OF FLINT - WATER PLANT</u>	<u>2310</u>
Supply Name	WSSN
<u>4500 N. DORT HWY</u>	<u>102,000</u>
Address	Population Served
<u>FLINT, MI 48505</u>	<u>GENESEE</u>
City, State, Zip	County

Contacts - Water Supply

<u>BRENT WRIGHT - PLANT SUPERVISOR</u>	<u>bwright@cityofflint.com</u>	<u>(810) 787-6537</u>
Name and Title	E-mail	Telephone
<u>MICHAEL GLASGOW - LAB SUPERVISOR</u>	<u>mglasgow@cityofflint.com</u>	<u>(810) 787-6537</u>
Name and Title	E-mail	Telephone
<u>DAUGHERTY JOHNSON - UTILITIES DIRECTOR</u>	<u>djohnson@cityofflint.com</u>	<u>(810) 766-7165</u>
Name and Title	E-mail	Telephone

Contacts - DEQ and Other

<u>ADAM ROSENTHAL</u>	<u>rosenthal@michigan.gov</u>	<u>(517) 335-6131</u>
DEQ Drinking Water Analyst Name	E-mail	Telephone
<u>MICHAEL PRYSBY</u>	<u>prysbym@michigan.gov</u>	<u>(517) 335-6122</u>
DEQ Drinking Water District Engineer Name	E-mail	Telephone
<u>Pollution Emergency Alerting System Information (PEAS)</u>		<u>1-800-292-4706</u>
Call PEAS number if unable to contact DEQ staff.		Telephone
<u>MAYOR DAYNE WALLING</u>	<u>dwalling@cityofflint.com</u>	<u>(810) 766-7346</u>
Local Official	E-mail	Telephone
<u>GENESEE COUNTY HEALTH DEPARTMENT</u>		<u>(810) 257-3155</u>
Health Department	E-mail	Telephone

Public Notification

<u>DAWN JONES - COMMUNICATION DIRECTOR CITY OF FLINT</u>	<u>(810) 237-2039</u>
Means of Public Notification	
<u>FLINT JOURNAL</u>	<u>()</u>
Newspaper Name and City	Telephone
<u>Radio/Television Name and Address or City</u>	<u>()</u>
E-mail	Telephone

Laboratory

<u>MDEQ - DRINKING WATER LABORATORY</u>	<u>(517) 335-8184</u>
Primary Laboratory Name	Telephone
<u>3350 NORTH M.L.KING BLVD LANSING, MI 48909</u>	
Primary Lab Address, City, State, Zip	
<u>PARAGON LABORATORIES</u>	<u>(734) 462-3900</u>
Alternate Laboratory Name	Telephone
<u>12649 RICHFIELD CT. LIVONIA, MI 48150</u>	
Alternate Lab Address, City, State, Zip	

Measure Chlorine Residual (under normal operating conditions)

- ☒ This supply serves water disinfected with chlorine or chloramines. The residual disinfectant level must be measured at the same time and the same location as each total coliform compliance sample (includes all routine AND repeat total coliform samples).

Monitor Total Trihalomethanes (TTHM) and Haloacetic Acids (HAA5) (under normal operating conditions)

Samples will be collected during the: ☐ 1st ☐ 2nd ☒ 3rd full week of the
 ... peak historical month (month of highest byproduct formation): AUGUST
 ... and during the same week every (check one): ☒ 90 days ☐ 1 year ☐ 3 years
 ... as indicated below:

Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
2nd full week of Feb. Example	2nd full week of May Example	2nd full week of Aug. Example	2nd full week of Nov. Example
3 rd FULL WEEK OF FEBRUARY	3 rd FULL WEEK OF MAY	3 rd FULL WEEK OF AUGUST	3 rd FULL WEEK OF NOVEMBER

Sampling for compliance under Stage 2 begins (month and year): MAY 2012

TTHM and HAA5 Sample Sites

	Sample For...	Site Code	Address of Sample Site	Rationale for Selection
Routine Monitoring Sites	☒ TTHM ☒ HAA5	DBP <u>1</u>	3719 MARION RD. FLINT, MI 48906	HIGHEST TTHM
	☒ TTHM ☒ HAA5	DBP <u>2</u>	3302 S DORT HWY FLINT, MI 48917	REMAINING HIGHEST HAA5
	☐ TTHM ☐ HAA5	DBP <u> </u>		
	Sites above cannot be replaced with sites below. Contact the DEQ if a site is no longer available.			
	☒ TTHM ☒ HAA5	DBP <u>3</u>	6204 N. SAGINAW ST FLINT, MI	REMAINING HIGHEST TTHM
	☒ TTHM ☒ HAA5	DBP <u>4</u>	2501 FUSHING RD. FLINT, MI 48904	REMAINING HIGHEST HAA5
	☐ TTHM ☐ HAA5	DBP <u> </u>		

Monitor Bromate (under normal operating conditions)

- ☐ This supply uses ozone. This supply must collect 1 sample per month for bromate at the entry point (plant tap) of each treatment plant that uses ozone. The DEQ may reduce frequency from monthly to quarterly if the bromate running annual average (RAA) is ≤ 0.0025 mg/L (milligrams per liter) (2.5 parts per billion [ppb]).

Schematic (optional)

☐ Check if a schematic is attached showing the sample sites in this monitoring plan.

TTHM and HAA5 Operational Evaluation

- ☒ This supply must conduct an operational evaluation if either the TTHM or the HAA5 Operational Evaluation Level (OEL) exceeds the maximum contaminant level (MCL). This supply must submit the written report to the DEQ district office within 90 days after learning the result that causes the OEL to exceed the MCL. The OEL is an estimate of the following quarter's locational running annual average (LRAAs). $OEL = 2 \text{ previous quarters results} + \text{twice the current quarter result, all divided by 4.}$

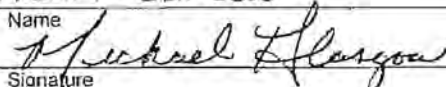
TTHM and HAA5 Increased Monitoring

A supply monitoring less frequently than quarterly must begin quarterly monitoring at all sites if any TTHM or HAA5 result is above the MCL at any site. Compliance with the MCL will be determined at the end of four consecutive quarters, including the quarter that triggered increased monitoring.

Sample Site Plan Completed By

MICHAEL GLASGOW

Name



Signature

LABORATORY + WATER QUALITY SUPERVISOR

Title

3/28/12

Date

mglasgow@cityofflut.com

E-mail

(810) 787-6537

Telephone

Compliance Calculation Procedures on following page.

Compliance Calculation Procedure

General

Where compliance is based on an RAA of monthly or quarterly samples or averages and the supply fails to monitor for TTHM, HAA5, or bromate, this failure will be treated as a monitoring violation for the entire period covered by the RAA.

All samples taken and analyzed from compliance sites must be included in determining compliance, even if that number is greater than the minimum required.

If any individual quarter's average will cause the RAA of that supply to exceed the MCL, the supply is out of compliance at the end of that quarter.

Chlorine

Chlorine maximum residual disinfectant level (MRDL) is 4.0 mg/L.

Compliance with the MRDL is based on an RAA, computed quarterly, of monthly averages of all measurements taken at the same place and time as total coliform compliance samples.

In cases where supplies switch between the use of chlorine and chloramines during the year, compliance will be based on all monitoring results of both chlorine and chloramines.

TTHM and HAA5

TTHM MCL is 0.080mg/L (80 ppb). HAA5 MCL is 0.060 mg/L (60 ppb).

Compliance with each MCL is based on the LRAA for TTHM and HAA5 at each location. If one location is out of compliance with the MCL, then the supply is out of compliance.

If monitoring annually or less frequently and no sample exceeds the MCL, the sample result for each monitoring location is considered the LRAA for that monitoring location. If a sample exceeds the MCL, the supply shall increase monitoring to a dual sample set at each location every 90 days and calculate compliance at the end of four quarters, including the quarter in which the sample exceeded the MCL.

If monitoring quarterly, the LRAA is calculated quarterly using results from each location. If the supply fails to complete four consecutive quarters of monitoring, compliance with the MCL will be based on the average of available data from the most recent four quarters. If the supply takes more than one sample per quarter at a monitoring location, an average of all samples taken in the quarter at that location will be used to determine the LRAA.

The supply is in violation of the MCL when the LRAA exceeds the MCL, based on four consecutive quarters of monitoring, or the LRAA calculated based on fewer than four quarters of data if the MCL would be exceeded regardless of the monitoring results of subsequent quarters. The supply is in violation of the monitoring requirements for each quarter that a result would be used in calculating an LRAA if the supply fails to monitor.

Bromate (for supplies using ozone)

Bromate MCL is 0.010 mg/L (10 ppb).

Compliance is based on an RAA of the most recent four quarters, computed quarterly, of monthly samples (or for months in which the supply takes more than one sample, the average of all samples taken during the month). If the average of samples covering any consecutive four-quarter period exceeds the MCL, the supply is in violation of the MCL and must notify the public, in addition to reporting to the DEQ. If a supply fails to complete 12 consecutive months of monitoring, compliance with the MCL for the last four-quarter compliance period is based on an average of the available data.

Control of Disinfection Precursors – Total Organic Carbon (TOC)

Applicability

- ☐ This supply uses conventional filtration to treat surface water or groundwater under the direct influence of surface water (including softening plants).

Sample Sites

- ☐ This supply will sample at each treatment plant using conventional filtration. Samples must be collected at the same time (may allow for the detention time in the treatment train between raw and finished water sampling points).

Sample for ...	At...	Further Describe the Specific Sample Site
Alkalinity	A point prior to any treatment	
Source water TOC		
Finished water TOC	The combined filter effluent no later than turbidity compliance point	

- ☐ This supply has more than 1 treatment plant and additional tables are attached.

Frequency

Monitor monthly unless reduced to quarterly by the DEQ (allowed if the treated water TOC RAA is < 2.0 mg/L for 2 consecutive years or < 1.0 mg/L for 1 year).

Treatment Technique

Compliance with the disinfection precursors' requirements is a treatment technique to control disinfection byproduct precursors or TOC, which is the medium for the formation of disinfection byproducts TTHM and HAA5. The treatment technique requires Subpart H supplies that use conventional filtration to reduce the TOC through enhanced coagulation or enhanced softening, so that TOC settles out before the disinfection is applied. However, supplies that meet alternative compliance criteria are not required to remove TOC through enhanced coagulation or enhanced softening (i.e., not required to meet the TOC percent removal requirements).

Four Methods to Comply With Treatment Technique

- A. Alternative compliance criteria (ACC). Compliance with ACC is determined quarterly.
1. Raw water TOC RAA is < 2.0 mg/L
 2. Finished water TOC RAA is < 2.0 mg/L
 3. Raw water TOC RAA is < 4.0 mg/L, raw water alkalinity RAA is > 60 mg/L, and either TTHM or HAA5 RAAs are ≤ 0.040 mg/L and 0.030 mg/L, respectively.
 4. TTHM and HAA5 RAAs are ≤ 0.040 mg/L and 0.030 mg/L, respectively and the supply uses only chlorine for primary disinfection and maintains a residual in the distribution system.
 5. Source water specific ultraviolet absorption (SUVA) RAA is ≤ 2.0 liters per milligram meter (L/mg-m). SUVA is defined as UV_{254} divided by dissolved organic carbon.
 6. Finished water SUVA RAA ≤ 2.0 l/mg-m.
- B. Additional ACC for the supply that practices enhanced softening but cannot achieve required TOC removals. Softening results in:
1. Lowering finished water alkalinity RAA to < 60 mg/L (as $CaCO_3$).
 2. Removing not less than 10 mg/L of magnesium hardness (as $CaCO_3$) measured monthly and calculated quarterly as an RAA.

- C. Step 1. The supply practices enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in this table.^{a, b}

Source-Water TOC, mg/L	Source-Water Alkalinity, mg/L as CaCO ₃		
	0-60	>60-120	>120 ^c
>2.0-4.0	35.0%	25.0%	15.0%
>4.0-8.0	45.0%	35.0%	25.0%
>8.0	50.0%	40.0%	30.0%

^aSupplies meeting at least one ACC are not required to operate with enhanced coagulation.

^bSoftening supplies meeting at least one additional ACC are not required to operate with enhanced softening.

^cSupplies practicing softening must meet the TOC removal requirements in this column.

- D. Step 2. The supply cannot achieve the Step 1 TOC removals due to water quality parameters or operational constraints.

The supply operates under alternative minimum TOC removal requirements (Step 2) or must apply to the DEQ, within 3 months of failure to achieve the TOC removals, for approval of Step 2 TOC removals. The DEQ may make Step 2 retroactive for the purposes of determining compliance. Until the DEQ approves the alternate minimum TOC removal requirements, the supply is expected to meet the Step 1 TOC removals.

Compliance Calculation Procedure

TOC removal compliance is calculated quarterly, beginning after the supply has collected 12 months of data, by determining an annual average using the following method:

1. Determine actual monthly TOC percent removal, equal to:
 $(1 - [\text{treated water TOC}/\text{source water TOC}]) \times 100$.
2. Determine the required monthly TOC percent removal (from Step 1 or Step 2).
3. Divide the value in line 1 of this section by the value in line 2 to determine the monthly value.
4. Add together the results of line 3 of this section for the last 12 months and divide by 12.
5. If the value calculated in line 4 of this section is less than 1.00, the supply is not in compliance with the TOC percent removal requirements.
6. Supply may assign a monthly value of 1.0 when any of the following criteria are met:
 - a. In any month that the supply's treated or source water TOC level is < 2.0 mg/L.
 - b. In any month that a supply practicing softening removes at least 10 mg/L of magnesium hardness (as CaCO₃).
 - c. In any month that the supply's source water SUVA, prior to any treatment, is ≤ 2.0 L/mg-m.
 - d. In any month that the supply's finished water SUVA is ≤ 2.0 L/mg-m.
 - e. In any month that a supply practicing enhanced softening lowers alkalinity below 60 mg/L (as CaCO₃).

Notes from the Surface Water Treatment Rule

A Subpart H supply must maintain a detectable residual in at least 95 percent of distribution samples each month. If the percent falls below 95 for 2 consecutive months, the supply is in violation of the treatment technique.

A Subpart H supply must measure the residual disinfectant at the entry point (plant tap). The residual shall not be less than 0.2 mg/L for more than 4 hours.



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

April 9, 2012

Mr. Brent Wright
City Of Flint - DPW
Flint Water Plant
4500 North Dort Highway
Flint, MI 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Stage 2 DDBP Monitoring Plan Approval

Your Stage 2 Disinfectants and Disinfection Byproduct (DDBP) Monitoring Plan was received and approved by this office. Please conduct routine monitoring in accordance with your Stage 2 DDBP Monitoring Plan as summarized below.

Monitor during the 3rd full week of May, August, November, and February at the following locations:

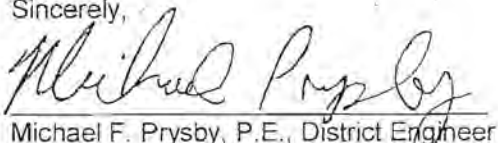
Sample For...	Site Code	Address of Sample Site
☒ TTHM ☒ HAA5	DBP1	3719 Davison Road
☒ TTHM ☒ HAA5	DBP2	3302 South Dort Highway
☒ TTHM ☒ HAA5	DBP3	6204 North Saginaw Street
☒ TTHM ☒ HAA5	DBP4	2501 Flushing Road

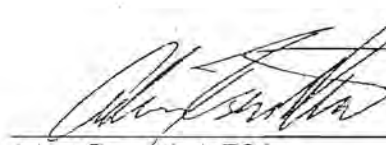
Please note that the monitoring requirements outlined in this letter are in addition to those specified in your 2012 Monitoring Schedule sent earlier this year. If your water supply qualifies for reduced monitoring in the future, you will be notified by the Department of Environmental Quality.

If you use a private laboratory, report the results to this office by the 10th of the month following the month in which results are received. Be sure to include WSSN and Site Code when submitting your results to ensure you receive proper credit for monitoring.

If you have questions, please contact us.

Sincerely,


Michael F. Prysby, P.E., District Engineer
Resource Management Division
prysbym@michigan.gov
517-335-6122


Adam Rosenthal, EQA
Resource Management Division
rosenthala@michigan.gov
517-335-6131

MFP:AR:JR

City of Flint
MORs

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT

WSSN: 2310

Michael Glasgow

Operator-in-Charge

October 2015

Month/Year

F-1R, F-2

Certification of Operator-in-Charge

F-1

Water Plant Classification

Signature of Operator-in-Charge

Genesee

County

DEQ
RESOURCE MANAGEMENT DIVISION

NOV 16 2015

LANSING DISTRICT

Treatment Rate and Filter Data

Maximum Treatment Rate:	<u>18.3</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>63</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>1.9</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>3.1</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>2.7%</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>18,000</u>	lb.	Est. supply:	<u>33</u>	days
Primary Coagulant (Ferric Chloride) on hand:	<u>181,220</u>	lb.	Est. supply:	<u>14</u>	days
Lime (CaO) on hand:	<u>161</u>	tons	Est. supply:	<u>15</u>	days
Fluoride on Hand:	<u>2,100</u>	lb.	Est. supply:	<u>6</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:

00

Number of filter confluence samples collected:

8282

Percent of filter confluence samples > 0.3 NTU:

0.0%0.0%

Number of filter confluence samples > 1 NTU

00

Did any individual filter exceed:

1.0 NTU in two consecutive measurements taken 15 minutes apart?

NO

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?

NO

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?

NO

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?

NO

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.

Avg.	12.8	12.2	3.6	14.8	161.1	5.3	0.89	5	11.0			1.89
Max.	17.3	14.4	4.9	17.0	198.6	5.6	0.95	6	16.2	28.3	9.00	3.41
Min.	0.0	10.7	2.7	12.0	123.3	5.0	0.77	0	7.3			0.99
Total	204.0											

Filter turbidity

City of Flint Water Treatment Plant

October 2015

Page 3

WSSN: 2310

Date	Turbidity, Units												
	Confluence Point. No.1 (N) North						Confluence Point. No.2 (S) South						Plant Tap 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	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	6	0.09	0.10	6	0	0	6	0.08	0.09	6	0	0	0.08
2	2	0.09	0.10	2	0	0	2	0.12	0.13	2	0	0	0.08
3	0	n/a	n/a	0	0	0	0	n/a	n/a	0	0	0	n/a
4	4	0.11	0.13	4	0	0	4	0.11	0.15	4	0	0	0.10
5	5	0.10	0.11	5	0	0	5	0.09	0.10	5	0	0	0.09
6	6	0.10	0.11	6	0	0	6	0.09	0.11	6	0	0	0.09
7	6	0.09	0.10	6	0	0	6	0.09	0.10	6	0	0	0.09
8	6	0.10	0.12	6	0	0	6	0.10	0.12	6	0	0	0.10
9	6	0.10	0.10	6	0	0	6	0.09	0.09	6	0	0	0.09
10	6	0.12	0.13	6	0	0	6	0.12	0.13	6	0	0	0.11
11	6	0.12	0.14	6	0	0	6	0.11	0.12	6	0	0	0.12
12	6	0.11	0.13	6	0	0	6	0.11	0.12	6	0	0	0.10
13	6	0.11	0.13	6	0	0	6	0.09	0.10	6	0	0	0.11
14	6	0.10	0.12	6	0	0	6	0.09	0.10	6	0	0	0.09
15	6	0.10	0.11	6	0	0	6	0.10	0.11	6	0	0	0.10
16	5	0.12	0.14	5	0	0	5	0.12	0.15	5	0	0	0.10
17													0.31
18													0.34
19													0.11
20													0.10
21													0.10
22													0.08
23													0.09
24													0.08
25													0.08
26													0.07
27													0.08
28													0.08
29													0.08
30													0.10
31													0.08
Avg.	5	0.10	0.12	5	0	0	5	0.10	0.11	5	0	0	
Max.	6	0.12	0.14	6	0	0	6	0.12	0.15	6	0	0	0.34
Min.	0	0.09	0.10	0	0	0	0	0.08	0.09	0	0	0	

Fluoridation &
Chlorination

City of Flint Water Treatment Plant

October 2015

Page 4

WSSN: 2310

Date	Fluoride Applied as F- mg/L	Fluoride Analysis (mg/L)			Phosphate Application (mg/L)			Phosphate Residual (mg/L)	Chlorine Application (mg/L)			Chlorine Residual (mg/L)					
					C.S. #2	P.S. #4	Total		Intermediate Chlorine	Post Chlorine	Total Chlorine	C.S. #2		3 MG Well		Tap	
		Raw	Tap	Dist.				Tap				Free	Total	Free	Total	Free	Total
1	0.5	0.21	0.73							4.7	4.7			2.3	2.6	1.8	2.1
2	0.5	0.22	0.71							4.5	4.5			2.7	3.0	2.1	2.4
3	n/a	n/a	0.74							n/a	0.0			1.9	2.1	1.6	1.8
4	0.6	0.21	0.74							3.7	3.7			1.1	1.3	1.6	1.8
5	0.5	0.22	0.67							5.0	5.0			2.4	2.7	2.3	2.6
6	0.6	0.21	0.81							4.5	4.5			2.1	2.4	2.0	2.3
7	0.5	0.22	0.73							4.6	4.6			2.1	2.4	2.0	2.3
8	0.5	0.22	0.70	0.78						4.5	4.5			2.1	2.3	2.1	2.4
9	0.5	0.25	0.72							4.1	4.1			2.3	2.5	2.2	2.4
10	0.5	0.24	0.68							4.2	4.2			2.0	2.3	1.9	2.2
11	0.5	0.22	0.72							4.4	4.4			2.4	2.7	1.5	1.9
12	0.5	0.24	0.73							4.2	4.2			2.3	2.5	2.3	2.6
13	0.5	0.23	0.73							4.4	4.4			2.0	2.3	2.0	2.3
14	0.5	0.21	0.73	0.69						4.2	4.2			2.2	2.5	2.2	2.5
15	0.5	0.21	0.72							4.3	4.3			2.2	2.5	2.2	2.5
16	0.5	0.21	0.72							4.2	4.2			2.1	2.4	2.2	2.5
17			0.68									0.8	1.0			0.8	1.0
18			0.70					1.15				0.8	1.0			0.7	0.9
19			0.66									0.9	1.1			0.9	1.0
20			0.68	0.67				1.19				0.9	1.1			0.9	1.1
21			0.68					1.22				0.9	1.1			0.7	0.9
22			0.64					1.16				0.8	1.0			0.8	1.0
23			0.66									0.9	1.1			0.9	1.1
24			0.66					1.24				0.9	1.1			0.9	1.1
25			0.62									0.9	1.1			0.9	1.0
26			0.67					1.14				0.9	1.0			0.9	1.0
27			0.68	0.66								1.0	1.1			1.0	1.1
28			0.66					1.26				0.9	1.0			0.9	1.0
29		0.23	0.69					1.26				0.8	0.9			0.8	0.9
30			0.74									0.9	1.1			0.8	1.1
31			0.76									0.9	1.1			0.8	1.0
Avg	0.51	0.22	0.70	0.70					0.0	4.4	4.1	0.9	1.1	2.1	2.4	1.4	1.7
Max	0.60	0.25	0.81	0.78					0.0	5.0	5.0	1.0	1.1	2.7	3.0	2.3	2.6
Min.	0.50	0.21	0.62	0.66					0.0	3.7	0.0	0.8	0.9	1.1	1.3	0.7	0.9

Chemical
AnalysesCity of Flint Water Treatment Plant
WSSN: 2310

October 2015

Page 5

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	8.13	7.33	260	136	228	42	32	94	82.6	44.9	13.1	5.8	43	84
2	8.19	7.15	272	146	220	36	52	110	84.2	50.5	15	4.9	47	88
3	n/a	7.26	n/a	138	n/a	38	n/a	100	n/a	42.5	n/a	7.8	n/a	86
4	8.27	7.19	260	130	222	36	38	94	83.4	42.5	12.6	5.8	47	87
5	8.32	7.55	262	152	222	50	40	102	85.0	48.9	12.3	7.3	46	84
6	8.31	7.37	272	134	226	40	46	94	77.0	36.1	19.4	10.7	50	88
7	8.30	7.46	266	134	228	40	38	94	82.6	42.5	14.6	6.8	44	80
8	8.35	7.36	262	134	224	44	38	90	84.2	44.1	12.6	5.8	46	82
9	8.28	7.54	264	128	220	42	44	86	90.6	36.9	9.2	8.7	47	83
10	8.27	7.81	264	174	220	74	44	100	93.8	64.1	10.7	3.4	48	77
11	8.30	7.96	272	154	224	66	48	88	87.4	47.3	13.1	8.7	44	77
12	8.35	7.61	270	144	226	60	44	84	85.8	44.9	13.6	7.8	47	77
13	8.36	7.60	276	132	222	48	54	84	89.0	42.5	13.1	6.3	45	79
14	8.33	7.60	276	142	226	46	50	96	86.6	46.5	14.6	6.3	46	84
15	8.34	7.46	274	144	226	44	48	100	89.8	45.7	12.3	7.3	43	81
16	8.33	7.51	286	144	224	46	62	98	113.0	54.5	1.5	1.9	50	85
17		7.59		106		72		34		33.7		5.3		18
18		7.57		108		60		48		32.9		6.3		46
19		7.41		98		72		26		32.9		3.9		12
20		7.46		102		74		28		31.3		5.8		12
21		7.44		100		76		24		33.7		3.9		12
22		7.49		102		76		26		32.1		5.3		12
23		7.37		102		70		32		40.1		0.5		13
24		7.38		102		74		28		30.5		5.8		13
25		7.41		102		72		30		31.3		5.8		13
26		7.36		102		74		28		30.5		6.3		11
27		7.39		100		74		26		29.7		6.3		13
28		7.41		100		72		28		31.3		5.3		12
29	8.32	7.46	268	100	226	72	42	28	93.0	29.7	8.7	6.3	43	12
30		7.22		104		72		32		30.5		6.8		13
31		7.37		100		72		28		33.7		6.8		14
Avg.	8.30	7.45	269	122	224	59	45	63	88.0	39.3	12.3	6.0	46	50
Max.	8.36	7.96	286	174	228	76	62	110	113.0	64.1	19.4	10.7	50	88
Min.	8.13	7.15	260	98	220	36	32	24	77.0	29.7	1.5	0.5	43	11

Bacteriological &
Physical Parameters

City of Flint Water Treatment Plant

October 2015

WSSN: 2310

Date	Total Coliform						Standard Plate Count (Simplate MPN)		Conductivity (mS)	Temp. C	Temp. C	Color	
	Raw (ColiIert MPN)		P. S. 4		Plant Tap								
	# Samples	Count	# Samples	# pos	# Samples	# pos	Raw	Tap	Tap	Raw	Tap	Raw	Tap
1	1	2143	6	0	1	0	1370	<2	0.47	18.8			
2	1	2187	6	0	1	0	2760	<2	0.47	17.3			
3	0	n/a	6	0	1	0	n/a	<2	0.48	n/a			
4	1	1565	6	0	1	0	1000	<2	0.39	15.2			
5	1	1789	6	0	1	0	900	<2	0.41	14.9			
6	1	3654	6	0	1	0	2160	<2	0.39	15.3			
7	1	2014	6	0	1	0	970	<2	0.38	15.1			
8	1	1860	6	0	1	0	900	<2	0.37	14.8			
9	1	12033	6	0	1	0	2310	<2	0.38	16.1			
10	1	2359	6	0	1	0	1120	<2	0.41	14.9			
11	1	4352	6	0	1	0	1950	<2	0.40	14.5			
12	1	2046	6	0	1	0	1280	<2	0.39	15.1			
13	1	2098	6	0	1	0	1280	<2	0.39	15.0			
14	1	2282	6	0	1	0	770	<2	0.38	14.9			
15	1	1720	6	0	1	0	1080	<2	0.38	14.9			
16	1	1250	6	0	1	0	860	2	0.38	14.6			
17					1	0		<2	0.21		16.5		
18					1	0		<2	0.27		15.4		
19					1	0		<2	0.19		15.3		
20					1	0		<2	0.20		15.2		
21					1	0		<2	0.20		15.1		
22					1	0			0.20		15.1		
23					1	0			0.19		15.1		
24					1	0			0.20		14.6		
25					2	0			0.20		14.8		
26					2	0			0.20		14.6		
27					2	0		<2	0.20		14.6		
28					2	0			0.20		14.7		
29	1	3076	2	0	2	0			0.20		14.4		
30			2	0	2	0			0.19		15.1		
31			2	0	2	0			0.20		14.9		
Avg.									0.31	15.4	15.0		
Max.		12033					2760	2	0.48	18.8	16.5		
Min.									0.19	14.5	14.4		

WSSN: 2310

Date	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l										
	1	2	3	4	5	6	7	8	CS	WS	Number of Samples
1	1.2	1.2	1.2	0.8	0.1	0.1	0.9	1.1	0.9	0.7	10
2											0
3											0
4											0
5											0
6											0
7	1.5	1.0	1.2	0.1	0.2	0.1	0.6	1.5	0.1	1.4	10
8	1.3	1.0	1.3	1.2	0.3	0.1	0.8	1.5	1.2	0.8	10
9											0
10											0
11											0
12											0
13	1.3	1.2	1.3	1.7	1.0	0.1	0.9	1.3	4.0	1.5	10
14	1.0	1.3	1.4	1.3	1.6	0.1	1.0	1.5	1.3	1.7	10
15	1.1	1.4	1.4	1.0	0.8	0.1	0.7	1.2	1.2	1.1	10
16											0
17											0
18											0
19											0
20	0.1	0.5	0.7	0.5	0.5	0.1	0.8	0.7	0.7	0.7	10
21	0.1	0.4	0.6	0.5	0.4	0.1	0.4	0.5	0.5	0.7	10
22											0
23											0
24											0
25											0
26											0
27	0.1	0.6	0.8	0.3	0.4	0.1	0.3	0.8	0.3	0.8	10
28	0.1	0.5	0.8	0.4	0.5	0.1	0.3	0.7	0.5	0.6	10
29											0
30											0

Distribution Sample Summary

Total # of routine distribution samples analyzed	100
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	0
Percent of routine distribution samples positive	0%

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	0.80

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	1.5	1.5	1.5	1.2	0.3	0.3	1.2	1.4	1.2	0.9	10
2											0
3											0
4											0
5											0
6											0
7	1.7	1.3	1.5	0.3	0.4	0.3	0.9	1.8	0.1	1.7	10
8	1.6	1.3	1.5	1.4	0.5	0.3	1.0	1.8	1.5	1.0	10
9											0
10											0
11											0
12											0
13	1.5	1.4	1.5	2.0	1.2	0.3	1.2	1.5	4.0	1.8	10
14	1.2	1.5	1.7	1.5	0.9	0.3	1.3	1.8	1.6	2.0	10
15	1.3	1.6	1.6	1.3	1.1	0.3	1.0	1.5	1.5	1.4	10
16											0
17											0
18											0
19											0
20	0.2	0.6	0.8	0.6	0.6	0.3	0.9	0.8	0.9	0.8	10
21	0.3	0.6	0.8	0.6	0.5	0.3	0.6	0.7	0.6	0.8	10
22											0
23											0
24											0
25											0
26											0
27	0.2	0.7	0.9	0.4	0.5	0.2	0.4	0.9	0.4	0.9	10
28	0.2	0.6	0.9	0.5	0.6	0.3	0.4	0.8	0.6	0.7	10
29											0
30											0

Distribution Disinfectant Total Residual Summary

Percent samples with a detectable disinfectant residual 100%

Average disinfectant residual this month 1.0

Positive Distribution Samples

[illegible]

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANTWSSN: 2310Michael Glasgow

Operator-in-Charge

September 2015

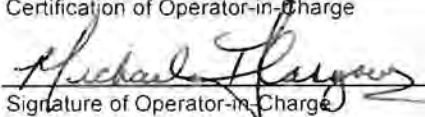
Month/Year

F-1R, F-2

Certification of Operator-in-Charge

F-1

Water Plant Classification


Signature of Operator-in-ChargeGenesee

County

DEQ
RESOURCE MANAGEMENT DIVISION

OCT 16 2015

LANSING DISTRICT

Treatment Rate and Filter Data

Maximum Treatment Rate:	<u>18.6</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>60</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>2.0</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>2.9</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>2.7%</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>20,000</u> lb.	Est. supply:	<u>24</u> days
Primary Coagulant (Ferric Chloride) on hand:	<u>151,901</u> lb.	Est. supply:	<u>9</u> days
Lime (CaO) on hand:	<u>223</u> tons	Est. supply:	<u>20</u> days
Fluoride on Hand:	<u>10,000</u> lb.	Est. supply:	<u>24</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:

00

Number of filter confluence samples collected:

179178

Percent of filter confluence samples > 0.3 NTU:

0.0%0.0%

Number of filter confluence samples > 1 NTU

00

Did any individual filter exceed:

1.0 NTU in two consecutive measurements taken 15 minutes apart?

NO

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?

NO

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?

NO

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?

NO

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.

Date	Million Gallons Treated	Ozone Dosage (mg/L)	Ferric as Fe3+ mg/L	Lime Dosage (mg/L)	PW-340 Cationic Polymer Dosage (mg/L)	P-142PWG Anionic Polymer Dosage (mg/L)	Turbidity, Units				
							Raw			Plate Settler	Applied
							Number of Samples	Avg	Max	Effluent Avg.	Applied Avg.
1	18.2	5.6	12.8	161.5	5.2	0.75	6	7.0	7.8	5.15	1.41
2	17.6	5.6	14.0	175.0	4.8	0.79	6	9.7	24.1	5.46	1.61
3	17.5	6.3	13.4	170.3	4.8	0.73	6	7.7	8.6	5.54	1.46
4	17.2	6.2	14.9	174.7	5.1	0.76	6	10.6	12.0	5.32	1.34
5	15.9	5.1	18.1	158.2	5.6	0.85	6	13.4	22.3	5.34	1.31
6	15.7	5.7	18.3	157.7	5.7	0.86	6	12.3	21.8	6.40	1.37
7	15.1	4.5	19.2	161.1	5.9	0.87	6	10.1	12.4	6.25	1.45
8	14.5	2.9	18.4	172.4	6.3	0.92	6	15.6	23.0	6.55	1.45
9	14.5	2.9	17.9	167.3	6.3	0.93	6	14.3	24.5	6.65	1.42
10	14.4	2.8	18.8	165.6	6.3	0.94	6	13.9	22.4	6.08	1.43
11	14.3	2.7	18.5	160.2	6.5	0.88	6	10.9	12.6	6.54	1.37
12	14.2	2.7	17.5	156.9	6.5	0.85	6	12.0	18.8	6.78	1.80
13	14.2	2.6	16.3	158.7	6.6	0.85	6	11.0	11.3	7.03	1.40
14	14.1	2.6	17.1	154.7	6.6	0.83	6	10.4	12.6	6.78	1.40
15	14.2	2.7	17.9	157.3	6.7	0.77	6	23.6	38.9	6.93	1.34
16	14.2	3.3	16.9	175.9	6.6	0.81	6	16.1	32.2	9.76	1.32
17	14.2	3.3	19.5	167.1	6.6	0.77	6	12.5	22.8	6.10	1.50
18	14.7	3.8	20.6	164.6	6.4	0.71	6	8.9	11.3	7.43	1.29
19	14.8	2.8	20.7	161.3	6.5	0.71	6	8.2	11.1	7.32	1.2
20	14.6	3.2	21.1	139.9	6.5	0.63	6	8.9	13.0	7.72	1.04
21	14.9	4.0	17.7	139.6	6.3	0.67	6	8.7	11.1	7.94	1.71
22	14.9	4.0	18.5	152.0	6.3	0.87	6	7.0	8.2	7.52	1.28
23	14.9	4.0	17.9	174.2	6.4	0.86	6	8.3	11.5	8.11	1.22
24	15.2	5.0	18.0	161.6	6.2	0.76	6	6.8	9.4	8.13	1.30
25	15.3	5.0	17.8	174.0	5.7	0.86	6	14.2	21.2	7.68	1.29
26	15.2	5.0	17.7	142.7	5.7	0.84	6	15.6	27.7	7.46	2.88
27	15.2	5.0	17.6	156.7	5.7	0.87	6	10.0	11.2	7.28	1.02
28	15.4	4.9	17.0	149.0	5.7	0.80	6	12.1	19.1	7.38	1.24
29	15.6	4.9	16.9	153.7	5.7	0.80	6	14.4	20.7	6.82	1.10
30	15.9	4.7	16.9	169.7	5.6	0.81	6	13.3	19.9	7.72	1.38
Avg.	15.2	4.1	17.6	161.1	6.0	0.81	6	11.6			1.41
Max.	18.2	6.3	21.1	175.9	6.7	0.94	6	23.6	38.9	9.76	2.88
Min.	14.1	2.6	12.8	139.6	4.8	0.63	6	6.8			1.02

Filter turbidity

City of Flint Water Treatment Plant

September 2015

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WSSN: 2310

Date	Turbidity, Units												
	Confluence Point, No.1 (N) North						Confluence Point, No.2 (S) South						Point of Entry
	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	Plant Tap NTU
1	6	0.11	0.13	6	0	0	6	0.11	0.11	6	0	0	0.10
2	6	0.11	0.13	6	0	0	6	0.11	0.13	6	0	0	0.10
3	6	0.10	0.14	6	0	0	6	0.10	0.10	6	0	0	0.09
4	6	0.11	0.13	6	0	0	6	0.10	0.11	6	0	0	0.10
5	6	0.10	0.12	6	0	0	6	0.11	0.12	6	0	0	0.09
6	6	0.10	0.10	6	0	0	6	0.10	0.10	6	0	0	0.10
7	6	0.11	0.12	6	0	0	6	0.10	0.11	6	0	0	0.09
8	6	0.10	0.13	6	0	0	6	0.09	0.10	6	0	0	0.09
9	6	0.10	0.11	6	0	0	6	0.10	0.10	6	0	0	0.09
10	6	0.10	0.12	6	0	0	6	0.09	0.10	6	0	0	0.09
11	6	0.10	0.11	6	0	0	6	0.11	0.12	6	0	0	0.09
12	6	0.12	0.16	6	0	0	6	0.11	0.12	6	0	0	0.10
13	6	0.12	0.12	6	0	0	6	0.11	0.12	6	0	0	0.10
14	6	0.11	0.14	6	0	0	6	0.11	0.14	6	0	0	0.10
15	6	0.11	0.12	6	0	0	6	0.11	0.12	6	0	0	0.10
16	6	0.10	0.12	6	0	0	6	0.10	0.11	6	0	0	0.09
17	6	0.10	0.11	6	0	0	6	0.09	0.11	6	0	0	0.09
18	6	0.09	0.11	6	0	0	6	0.09	0.10	6	0	0	0.09
19	5	0.08	0.09	5	0	0	5	0.07	0.08	5	0	0	0.08
20	6	0.08	0.10	6	0	0	6	0.08	0.09	6	0	0	0.08
21	6	0.09	0.09	6	0	0	6	0.09	0.14	6	0	0	0.08
22	6	0.10	0.12	6	0	0	6	0.10	0.12	6	0	0	0.09
23	6	0.09	0.10	6	0	0	6	0.09	0.10	6	0	0	0.09
24	6	0.09	0.11	6	0	0	6	0.08	0.10	6	0	0	0.08
25	6	0.10	0.10	6	0	0	5	0.09	0.10	5	0	0	0.09
26	6	0.10	0.12	6	0	0	6	0.10	0.14	6	0	0	0.09
27	6	0.09	0.09	6	0	0	6	0.09	0.10	6	0	0	0.09
28	6	0.09	0.10	6	0	0	6	0.09	0.10	6	0	0	0.08
29	6	0.10	0.11	6	0	0	6	0.09	0.10	6	0	0	0.09
30	6	0.09	0.09	6	0	0	6	0.09	0.10	6	0	0	0.08
Avg.	6	0.10	0.11	6	0	0	6	0.10	0.11	6	0	0	
Max.	6	0.12	0.16	6	0	0	6	0.11	0.14	6	0	0	0.10
Min.	5	0.08	0.09	5	0	0	5	0.07	0.08	5	0	0	

Fluoridation &
Chlorination

City of Flint Water Treatment Plant

September 2015

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WSSN: 2310

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			3 MG Well		Tap	
		Raw	Tap	Dist.				Free	Total	Free	Total	Free	Total
1	0.5	0.22	0.77		0.0	4.8	4.8			2.3	2.6	2.4	2.6
2	0.5	0.21	0.79	0.73	0.0	4.7	4.7			2.3	2.6	2.3	2.7
3	0.5	0.21	0.78		0.0	4.5	4.5			2.4	2.8	2.2	2.5
4	0.6	0.20	0.73		0.0	5.0	5.0			2.1	2.5	1.9	2.3
5	0.6	0.20	0.81		0.0	5.2	5.2			2.2	2.6	1.9	2.2
6	0.6	0.21	0.81		0.0	5.4	5.4			2.5	2.8	1.9	2.2
7	0.7	0.19	0.81		0.0	5.8	5.8			2.2	2.4	1.9	2.2
8	0.6	0.19	0.81		0.0	4.9	4.9			2.5	2.8	2.2	2.6
9	0.6	0.21	0.79	0.79	0.0	5.0	5.0			2.3	2.6	2.0	2.4
10	0.6	0.21	0.80		0.0	5.0	5.0			2.2	2.4	2.1	2.4
11	0.5	0.22	0.76		0.0	5.1	5.1			2.1	2.4	2.0	2.4
12	0.5	0.19	0.72		0.0	5.3	5.3			2.3	2.6	2.2	2.5
13	0.6	0.18	0.75		0.0	5.2	5.2			1.7	2.0	1.8	2.1
14	0.6	0.19	0.78		0.0	5.5	5.5			2.2	2.6	2.2	2.6
15	0.6	0.22	0.80	0.78	0.0	5.1	5.1			2.4	2.7	2.4	2.7
16	0.6	0.20	0.77		0.0	5.1	5.1			2.1	2.4	2.1	2.4
17	0.6	0.21	0.81		0.0	5.2	5.2			2.0	2.3	1.9	2.2
18	0.5	0.21	0.75		0.0	5.1	5.1			2.2	2.5	2.1	2.6
19	0.5	0.20	0.72		0.0	5.0	5.0			2.1	2.3	1.9	2.3
20	0.5	0.21	0.74		0.0	5.1	5.1			2.1	2.4	1.9	2.3
21	0.4	0.21	0.70		0.0	5.3	5.3			2.0	2.3	1.8	2.1
22	0.5	0.23	0.75		0.0	5.1	5.1			2.2	2.5	2.0	2.3
23	0.6	0.22	0.76	0.75	0.0	4.9	4.9			2.2	2.5	2.0	2.3
24	0.5	0.20	0.72		0.0	4.8	4.8			2.4	2.6	1.9	2.1
25	0.5	0.21	0.76		0.0	4.8	4.8			2.1	2.4	1.8	2.3
26	0.5	0.20	0.70		0.0	3.9	3.9			2.3	2.6	1.8	2.0
27	0.5	0.21	0.75		0.0	4.8	4.8			2.3	2.7	2.3	2.7
28	0.5	0.21	0.76		0.0	4.7	4.7			2.3	2.6	2.2	2.5
29	0.5	0.21	0.74		0.0	4.8	4.8			2.3	2.5	2.3	2.6
30	0.5	0.21	0.74		0.0	4.8	4.8			2.1	2.4	1.8	2.1
Avg.	0.54	0.21	0.76	0.76	0.0	5.0	5.0			2.2	2.5	2.0	2.4
Max.	0.70	0.23	0.81	0.79	0.0	5.8	5.8			2.5	2.8	2.4	2.7
Min.	0.40	0.18	0.70	0.73	0.0	3.9	3.9			1.7	2.0	1.8	2.0

Chemical Analyses

City of Flint Water Treatment Plant

September 2015

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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	8.24	7.32	262	126	224	40	38	86	74.5	34.5	18.4	9.7	48	82
2	8.26	7.55	256	130	222	48	34	82	78.6	36.1	14.6	9.7	52	81
3	8.30	7.42	266	128	218	52	48	76	89.8	41.7	10.2	5.8	49	84
4	8.35	7.39	262	126	214	40	48	86	94.6	40.9	6.3	5.8	80	80
5	8.42	7.40	262	134	222	42	40	92	85.8	48.1	11.7	3.4	45	86
6	7.30	7.30	264	138	222	38	42	100	85.0	43.3	12.6	7.3	47	90
7	8.35	7.26	258	132	224	36	34	96	81.0	40.1	13.6	7.8	45	92
8	8.30	7.28	256	134	216	40	40	94	81.0	45.7	13.1	4.9	44	87
9	8.26	7.25	260	136	218	42	42	94	71.3	42.5	19.9	7.3	45	89
10	8.35	7.43	254	134	218	44	36	90	76.2	43.3	15.5	6.3	46	90
11	8.25	7.21	246	126	206	40	40	86	70.5	39.3	17	6.8	51	92
12	8.16	7.26	248	130	206	38	42	92	81.0	42.5	11.2	5.8	42	84
13	8.21	7.32	256	132	206	42	50	90	84.2	43.3	11.2	5.8	42	83
14	8.31	7.40	250	138	212	42	38	96	81.8	44.9	11.2	6.3	44	83
15	8.26	7.42	250	130	212	42	38	88	81.0	40.1	11.7	7.3	46	86
16	8.26	7.33	254	134	220	40	34	94	85.0	40.9	10.2	7.8	46	85
17	8.21	7.44	250	134	216	44	34	90	73.7	41.7	16	7.3	47	97
18	8.17	7.28	256	132	194	36	62	96	68.1	35.3	20.9	10.7	42	91
19	8.22	7.44	256	140	220	34	36	106	83.4	47.3	11.7	5.3	44	92
20	8.21	7.27	270	142	214	36	56	106	84.2	45.7	14.6	6.8	45	95
21	8.24	7.28	256	142	220	38	36	104	80.2	42.5	13.6	8.7	44	93
22	8.35	7.35	258	132	232	40	26	92	81.8	40.1	13.1	7.8	47	89
23	8.24	7.34	254	136	220	38	34	98	82.6	44.9	11.7	5.8	45	87
24	8.21	7.36	260	138	222	40	38	98	83.4	43.3	12.6	7.3	48	92
25	8.28	7.26	258	142	216	36	42	106	81.0	34.5	13.1	4.9	51	94
26	8.41	7.35	266	132	226	38	40	94	85.0	41.7	13.1	6.8	45	89
27	8.34	7.26	262	130	220	36	42	94	85.8	42.5	11.7	5.8	43	87
28	8.29	7.29	264	138	220	38	44	100	74.5	40.9	19	8.7	50	88
29	8.14	7.26	260	130	222	40	38	90	72.1	39.3	19.4	7.8	51	90
30	8.15	7.37	266	136	220	40	46	96	85.8	44.9	12.6	5.8	46	86

Avg.	8.23	7.34	258	134	217	40	41	94	80.8	41.7	13.7	6.9	47	88
Max.	8.42	7.55	270	142	232	52	62	106	94.6	48.1	20.9	10.7	80	97
Min.	7.3	7.21	246	126	194	34	26	76	68.1	34.5	6.3	3.4	42	80

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
WSSN: 2310

September 2015

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Date	Total Coliform						Standard Plate Count (Simplate MPN)		Conductivity (mS)	Temp. C	Color		Odor	
	Raw (Coli-ert MPN)		P.S. 4		Plant Tap									
	# Samples	Count	# Samples	# pos	# Samples	# pos	Raw	Tap	Tap	Raw	Raw	Tap	Raw	Tap
1	1	1850	6	0	1	0	1120	<2	0.38	21.9				
2	1	3255	6	0	1	0	2390	<2	0.41	22.3				
3	1	3076	6	0	1	0	1610	2	0.41	23.0				
4	1	12033	6	0	1	0	4140	<2	0.40	23.6				
5	1	17329	6	0	1	0	1830	<2	0.42	23.6				
6	1	5794	6	0	1	0	2230	<2	0.43	23.8				
7	1	5172	6	0	1	0	1510	<2	0.41	24.8				
8	1	19863	6	0	1	0	>7380	<2	0.41	24.6				
9	1	7270	6	0	1	0	3110	<2	0.41	25.0				
10	1	14136	6	0	1	0	1660	<2	0.41	23.7				
11	1	14136	6	0	1	0	2990	<2		23.3				
12	1	7701	6	0	1	0	3550	<2	0.41	21.5				
13	1	4611	6	0	1	0	1560	<2	0.41	19.6				
14	1	3873	6	0	1	0	1610	<2	0.41	19.6				
15	1	4352	6	0	1	0	7380	<2	0.40	20.0				
16	1	3654	6	0	1	0	>7380	<2	0.41	20.0				
17	1	2098	6	0	1	0	3110	<2	0.41	21.6				
18	1	3255	6	0	1	0	>7380	4	0.44	22.0				
19	1	9804	6	0	1	0	1710	2	0.44	22.2				
20	1	3448	6	0	1	0	1240	<2	0.44	20.3				
21	1	2187	6	0	1	0	1460	<2	0.49	20.3				
22	1	2700	6	0	1	0	1610	<2	0.48	20.3				
23	1	2143	6	0	1	0	1120	<2	0.49	20.2				
24	1	1872	6	0	1	0	1240	<2	0.49	20.3				
25	1	2282	6	0	1	0	1370	<2	0.48	22.2				
26	1	4352	6	0	1	0	1240	2	0.48	21.4				
27	1	3130	6	0	1	0	2020	<2	0.48	21.1				
28	1	2909	6	0	1	0	1710	<2	0.47	21.5				
29	1	2603	6	0	1	0	1460	<2	0.47	21.4				
30	1	2014	6	0	1	0	1950	<2	0.48	19.8				

Avg.									0.44	21.8				
Max.		19863					7380	< 2	0.49	25.0				
Min.									0.38	19.6				

WSSN: 2310

Date	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l										
	1	2	3	4	5	6	7	8	CS	WS	Number of Samples
1	1.3	1.1	1.6	1.0	0.6	0.3	0.4	1.8	1.4	1.9	10
2	1.0	1.4	1.3	1.1	0.5	0.1	0.5	1.4	1.0	1.2	10
3	1.3	1.5	1.3	0.8	0.4	0.1	1.2	1.4	0.7	1.6	10
4											0
5											0
6											0
7											0
8	1.3	1.0	1.5	1.0	0.5	0.1	0.9	1.6	0.5	0.8	10
9	0.8	0.5	1.6	1.0	0.3	0.1	0.9	1.3	0.9	0.7	10
10											0
11											0
12											0
13											0
14											0
15	1.3	1.6	1.6	1.4	0.5	0.1	0.9	1.6	0.5	0.7	10
16	0.6	1.2	1.4	0.8	0.4	0.2	0.7	1.3	0.5	1.6	10
17											0
18											0
19											0
20											0
21											0
22	1.0	1.0	1.3	1.0	0.5	0.5	0.1	0.6	1.2	0.5	10
23	0.1	1.1	1.3	1.0	0.4	0.1	0.8	1.2	0.4	1.2	10
24	1.0	0.8	1.3	0.8	0.3	0.1	0.6	1.2	0.9	0.6	10
25											0
26											0
27											0
28											0
29											0
30											0

Distribution Sample Summary

Total # of routine distribution samples analyzed	100
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	0
Percent of routine distribution samples positive	0%

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	0.90

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	1.5	1.4	1.9	1.2	0.9	0.5	0.7	2.1	1.7	2.2	10
2	1.3	1.7	1.6	1.4	0.8	0.1	0.8	1.7	1.3	1.5	10
3	1.6	1.8	1.6	1.2	0.7	0.2	1.5	1.7	1.0	1.8	10
4											0
5											0
6											0
7											0
8	1.6	1.3	1.8	1.3	0.8	0.3	1.3	1.9	0.8	1.0	10
9	1.1	0.7	1.9	1.3	0.5	0.3	1.2	1.6	1.2	0.9	10
10											0
11											0
12											0
13											0
14											0
15	1.6	1.9	1.9	1.7	0.7	0.2	1.2	2.0	0.7	1.0	10
16	0.9	1.5	1.7	1.1	0.6	0.3	1.0	1.6	0.7	1.9	10
17											0
18											0
19											0
20											0
21											0
22	1.3	1.3	1.6	1.3	0.7	0.7	0.3	0.9	1.5	0.7	10
23	0.3	1.4	1.6	1.3	0.6	0.3	1.1	1.5	0.6	1.5	10
24	1.3	1.1	1.6	1.1	0.5	0.3	0.9	1.5	1.3	0.9	10
25											0
26											0
27											0
28											0
29											0
30											0

Distribution Disinfectant Total Residual Summary

Percent samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	1.2

Positive Distribution Samples

[illegible]

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT
 WSSN: 2310

Michael Glasgow

Operator-in-Charge

August 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>20.2</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>68</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>2.2</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>2.9</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>3.4%</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>20,000</u> lb.	Est. supply:	<u>24</u> days
Primary Coagulant (Ferric Chloride) on hand:	<u>179,000</u> lb.	Est. supply:	<u>14</u> days
Lime (CaO) on hand:	<u>192</u> tons	Est. supply:	<u>19</u> days
Fluoride on Hand:	<u>18,000</u> lb.	Est. supply:	<u>40</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>213</u>	<u>213</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.		

WSSN: 2310

Date	Million Gallons Treated	Ozone Dosage (mg/L)	Ferric as Fe3+ mg/L	Lime Dosage (mg/L)	PW-340 Cationic Polymer Dosage (mg/L)	P-142PWG Anionic Polymer Dosage (mg/L)	Turbidity, Units				
							Raw			Plate Settler	Applied
							Number of Samples	Avg.	Max.	Effluent Avg.	Applied Avg.
1	16.1	4.5	16.5	149.6	4.8	0.90	6	7.8	10.6	3.91	2.72
2	15.1	4.6	16.0	168.6	5.0	0.88	6	7.2	10.2	3.54	2.58
3	15.5	4.7	15.9	155.0	4.8	0.91	6	11.2	17.5	3.53	1.17
4	15.8	4.3	15.3	160.3	4.7	0.87	6	9.0	10.3	4.34	1.65
5	15.7	4.5	16.3	159.4	4.7	0.89	6	7.1	8.2	3.62	1.23
6	15.5	4.3	16.4	148.6	4.6	0.93	6	7.2	8.6	3.58	1.55
7	16.5	4.5	15.3	135.9	4.5	0.88	6	6.6	7.3	3.42	1.18
8	17.2	4.2	14.6	147.5	4.8	0.88	6	6.8	7.7	3.17	1.29
9	17.4	4.3	14.7	164.8	4.7	0.90	6	8.5	10.6	4.06	1.54
10	17.4	4.3	14.8	168.4	4.5	0.84	6	10.1	13.5	4.02	1.24
11	17.2	4.1	14.0	171.5	4.5	0.83	6	9.9	20.1	3.96	1.10
12	17.2	4.0	14.0	148.3	4.3	0.84	6	16.5	42.3	4.09	1.50
13	17.3	4.3	15.0	163.2	4.5	0.93	6	14.3	39.7	4.33	1.45
14	17.5	4.2	16.0	156.7	1.7	0.89	6	16.6	25.2	4.48	1.20
15	17.7	4.2	16.6	150.8	4.7	0.90	6	10.0	21.5	5.65	1.05
16	17.7	4.2	16.8	149.5	4.8	0.84	6	11.6	22.9	4.96	1.19
17	17.3	4.2	19.3	158.5	4.9	0.85	6	12.1	24.8	4.52	1.07
18	17.7	4.1	16.6	160.0	4.7	0.85	6	4.7	5.1	4.57	1.54
19	17.8	4.1	16.0	175.3	4.6	0.87	6	7.0	13.4	4.01	1.4
20	17.9	4.3	16.4	165.9	4.5	0.81	6	5.9	8.7	4.90	1.05
21	18.1	4.5	16.7	155.5	4.4	0.82	6	7.3	8.2	4.58	1.73
22	19.0	4.4	15.0	170.5	4.3	0.84	6	9.1	22.4	3.93	1.23
23	19.1	4.5	16.6	173.7	4.7	0.86	6	10.7	23.2	5.05	1.31
24	18.9	4.9	16.3	179.7	4.9	0.90	6	7.1	8.2	5.39	1.28
25	19.7	4.9	15.7	165.7	4.7	0.87	6	9.1	22.4	4.99	0.94
26	19.8	5.0	15.9	160.0	4.6	0.08	6	10.7	23.2	5.10	1.32
27	19.5	5.1	15.8	153.5	4.7	0.78	6	7.1	8.2	5.63	1.26
28	19.0	5.1	17.6	163.5	4.9	0.80	6	8.5	20.1	6.02	1.04
29	19.3	5.2	15.9	162.1	4.9	0.80	6	8.5	9.6	5.85	1.49
30	18.4	5.3	18.8	165.5	5.1	0.79	6	7.0	7.6	6.25	1.10
31	18.8	5.4	15.8	151.1	5.0	0.79	6	7.6	8.5	5.54	2.02

[illegible]

Filter turbidity

City of Flint Water Treatment Plant

August 2015

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WSSN: 2310

Date	Turbidity, Units												
	Confluence Point. No.1 (N) North						Confluence Point. No.2 (S) South						Point of Entry
	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	Plant Tap NTU
1	3	0.09	0.11	3	0	0	3	0.08	0.09	3	3	0	0.09
2	7	0.10	0.12	6	0	0	7	0.09	0.10	6	0	0	0.09
3	7	0.07	0.09	6	0	0	7	0.08	0.09	6	0	0	0.11
4	7	0.13	0.26	6	0	0	7	0.10	0.11	6	0	0	0.13
5	7	0.10	0.12	6	0	0	7	0.10	0.11	6	0	0	0.12
6	7	0.11	0.15	6	0	0	7	0.13	0.16	6	0	0	0.13
7	7	0.13	0.14	6	0	0	7	0.12	0.13	6	0	0	0.15
8	7	0.13	0.15	6	0	0	7	0.10	0.12	6	0	0	0.14
9	7	0.14	0.17	6	0	0	7	0.11	0.12	6	0	0	0.15
10	7	0.12	0.13	6	0	0	7	0.10	0.11	6	0	0	0.14
11	7	0.11	0.14	6	0	0	7	0.10	0.11	6	0	0	0.13
12	7	0.10	0.11	6	0	0	7	0.11	0.13	6	0	0	0.14
13	7	0.12	0.14	6	0	0	7	0.11	0.13	6	0	0	0.14
14	7	0.11	0.18	6	0	0	7	0.10	0.11	6	0	0	0.11
15	7	0.11	0.17	6	0	0	7	0.09	0.09	6	0	0	0.10
16	7	0.11	0.12	6	0	0	7	0.09	0.11	6	0	0	0.12
17	7	0.09	0.11	6	0	0	7	0.10	0.12	6	0	0	0.15
18	7	0.10	0.12	6	0	0	7	0.10	0.12	6	0	0	0.12
19	7	0.11	0.16	6	0	0	7	0.09	0.10	6	0	0	0.12
20	7	0.10	0.14	6	0	0	7	0.11	0.12	6	0	0	0.11
21	7	0.10	0.11	6	0	0	7	0.11	0.11	6	0	0	0.10
22	7	0.12	0.14	6	0	0	7	0.10	0.12	6	0	0	0.11
23	7	0.09	0.10	6	0	0	7	0.10	0.12	6	0	0	0.10
24	7	0.10	0.11	6	0	0	7	0.10	0.12	6	0	0	0.11
25	7	0.10	0.13	6	0	0	7	0.10	0.12	6	0	0	0.09
26	7	0.10	0.11	6	0	0	7	0.09	0.11	6	0	0	0.10
27	7	0.09	0.12	6	0	0	7	0.11	0.13	6	0	0	0.09
28	7	0.11	0.11	6	0	0	7	0.10	0.12	6	0	0	0.10
29	7	0.10	0.11	6	0	0	7	0.09	0.09	6	0	0	0.09
30	7	0.10	0.11	6	0	0	7	0.09	0.09	6	0	0	0.09
31	7	0.11	0.17	6	0	0	7	0.10	0.12	6	0	0	0.10
Avg.	7	0.11	0.13	6	0	0	7	0.10	0.11	6	0	0	
Max.	7	0.14	0.26	6	0	0	7	0.13	0.16	6	3	0	0.15
Min.	3	0.07	0.09	3	0	0	3	0.08	0.09	3	0	0	

**Fluoridation &
Chlorination**
**City of Flint Water Treatment Plant
WSSN: 2310**

August 2015

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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	0.18	0.78	0.74	2.2	3.6	5.8	0.4	0.6	2.3	2.6	2.0	2.4
2	0.6	0.19	0.64		2.2	4.6	6.8	0.6	0.9	2.3	2.6	2.1	2.4
3	0.6	0.19	0.84		0.9	5.6	6.5	0.2	0.5	2.6	3.0	2.6	3.0
4	0.6	0.19	0.77		0.0	4.9	4.9	0.0	0.0	2.3	2.9	1.2	1.6
5	0.6	0.20	0.77		0.0	5.4	5.4	0.0	0.0	2.3	2.7	1.8	2.1
6	0.6	0.18	0.78	0.76	0.0	5.6	5.6	0.0	0.0	2.5	3.0	2.4	2.9
7	0.6	0.19	0.76		0.0	5.3	5.3	0.0	0.0	2.5	2.9	2.0	2.5
8	0.5	0.19	0.72		0.0	5.3	5.3	0.0	0.0	2.4	2.8	2.0	2.3
9	0.6	0.19	0.78		0.0	5.7	5.7	0.0	0.0	2.4	2.8	2.0	2.3
10	0.6	0.18	0.75		0.0	5.2	5.2	0.0	0.0	2.2	2.5	1.8	2.2
11	0.5	0.19	0.76		0.0	5.8	5.8	0.0	0.0	2.3	2.7	1.1	1.4
12	0.5	0.20	0.78	0.75	0.0	5.3	5.3	0.0	0.0	1.8	2.4	1.6	1.9
13	0.6	0.20	0.76		0.0	5.5	5.5	0.0	0.0	2.3	3.0	2.2	2.6
14	0.6	0.20	0.73		0.0	5.4	5.4	0.0	0.0	2.4	2.9	2.1	2.4
15	0.6	0.18	0.75		0.0	5.6	5.6	0.0	0.0	2.2	2.4	2.0	2.3
16	0.6	0.20	0.75		0.0	5.1	5.1	0.0	0.0	2.6	2.9	1.7	1.9
17	0.6	0.19	0.76		0.0	5.6	5.6	0.0	0.0	2.1	2.3	2.0	2.3
18	0.6	0.17	0.74		0.0	5.1	5.1	0.0	0.0	2.6	2.9	2.4	2.7
19	0.6	0.20	0.76	0.79	0.0	5.2	5.2	0.0	0.0	2.4	2.7	2.2	2.5
20	0.6	0.19	0.74		0.0	5.7	5.7	0.0	0.0	2.4	2.7	1.7	2.1
21	0.6	0.19	0.71		0.0	5.8	5.8	0.0	0.0	2.0	2.4	1.6	1.9
22	0.5	0.21	0.72		0.0	5.2	5.2	0.0	0.0	2.2	2.5	2.0	2.4
23	0.5	0.20	0.72		0.0	5.0	5.0	0.0	0.0	2.2	2.5	1.3	1.5
24	0.6	0.21	0.76		0.0	4.9	4.9	0.0	0.0	2.4	2.7	2.4	2.7
25	0.5	0.19	0.74		0.0	4.8	4.8	0.0	0.0	2.2	2.5	1.8	2.2
26	0.5	0.21	0.75	0.79	0.0	5.0	5.0	0.0	0.0	2.2	2.5	2.0	2.3
27	0.5	0.20	0.79		0.0	5.1	5.1	0.0	0.0	2.7	2.9	2.3	2.7
28	0.5	0.19	0.67		0.0	5.2	5.2	0.0	0.0	2.3	2.5	1.9	2.3
29	0.6	0.20	0.78		0.0	5.1	5.1	0.0	0.0	2.3	2.6	2.3	2.6
30	0.6	0.20	0.79		0.0	4.7	4.7	0.0	0.0	2.3	2.6	2.3	2.6
31	0.5	0.20	0.70		0.0	4.7	4.7	0.0	0.0	2.2	2.5	1.9	2.3

Avg.	0.57	0.19	0.75	0.76	0.2	5.2	5.4	0.0	0.1	2.3	2.7	2.0	2.3
Max.	0.60	0.21	0.84	0.79	2.2	5.8	6.8	0.6	0.9	2.7	3.0	2.6	3.0
Min.	0.50	0.17	0.64	0.74	0.0	3.6	4.7	0.0	0.0	1.8	2.3	1.1	1.4

Chemical
Analyses

City of Flint Water Treatment Plant

August 2015

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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	8.01	7.48	248	160	212	64	36	96	81.8	57.7	10.7	3.9	44	87
2	8.06	7.45	254	142	210	50	44	92	81.8	48.9	12.2	4.9	42	86
3	8.09	7.28	238	126	208	38	30	88	72.9	40.9	13.6	5.8	45	87
4	8.23	7.24	254	126	212	34	42	92	81.0	43.3	12.6	4.4	43	80
5	8.22	7.26	250	138	208	40	42	98	81.0	44.9	11.7	6.3	44	85
6	8.27	7.38	254	128	208	38	46	90	83.4	42.5	11.2	5.3	43	82
7	8.37	7.24	244	130	206	38	38	92	77.0	37.7	12.6	8.7	46	86
8	8.33	7.38	252	128	216	36	36	92	81.8	41.7	10.2	5.8	43	81
9	8.33	7.53	260	122	216	38	44	84	82.6	40.9	13.1	4.9	42	80
10	8.24	7.25	256	124	222	34	34	90	84.2	41.7	11.2	4.9	41	80
11	8.21	7.17	254	128	218	36	36	92	82.6	46.5	11.7	3.9	44	81
12	8.23	7.26	258	132	224	40	34	92	69.7	38.5	20.4	8.7	44	85
13	8.40	7.27	254	130	214	44	40	86	72.9	36.9	17.5	9.2	45	82
14	8.28	7.42	252	128	216	42	36	86	91.4	47.3	5.8	2.4	45	81
15	8.20	7.44	254	134	210	40	44	94	80.2	43.3	13.1	6.3	42	89
16	8.25	7.30	260	136	216	38	44	98	85.0	45.7	11.7	5.3	43	85
17	8.33	7.32	260	138	218	34	42	104	79.4	44.1	15.1	6.8	44	90
18	8.30	7.40	256	128	220	38	36	90	81.0	39.3	13.1	7.3	44	89
19	8.21	7.33	254	134	222	44	32	90	76.2	38.5	15.6	9.2	46	84
20	8.11	7.42	252	128	216	46	36	82	74.5	43.3	16.0	4.9	51	86
21	8.20	7.40	252	124	218	40	34	84	73.7	40.1	16.5	5.8	45	90
22	8.20	7.37	256	132	212	40	44	92	79.4	38.5	14.1	8.7	45	83
23	8.23	7.34	262	130	214	38	48	92	85.0	41.7	12.2	6.3	44	85
24	8.33	7.39	258	128	222	38	36	90	81.0	41.7	13.6	5.8	45	85
25	8.30	7.43	260	138	222	44	38	94	82.6	50.5	13.1	5.3	46	90
26	8.26	7.21	262	130	218	38	44	92	85.0	42.5	12.2	5.8	45	84
27	8.24	7.33	256	134	226	40	30	94	82.6	44.1	12.2	5.8	47	88
28	8.30	7.38	254	134	214	40	40	94	89.0	48.9	7.8	2.9	44	83
29	8.30	7.19	262	128	218	34	44	94	86.6	40.1	11.2	6.8	44	85
30	8.23	7.41	258	132	214	30	44	102	81.8	44.1	13.1	5.3	45	85
31	8.38	7.41	266	134	228	40	38	94	85.8	45.7	12.6	4.9	43	83

Avg.	8.25	7.34	255	132	216	40	39	92	81.1	43.3	12.8	5.9	44	85
Max.	8.40	7.53	266	160	228	64	48	104	91.4	57.7	20.4	9.2	51	90
Min.	8.01	7.17	238	122	206	30	30	82	69.7	36.9	5.8	2.4	41	80

Bacteriological &
Physical Parameters

City of Flint Water Treatment Plant

August 2015

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WSSN: 2310

Date	Total Coliform						Standard Plate Count (Simplate MPN)		Conductivity (mS)	Temp. C	Color		Odor	
	Raw (Colilert MPN)		3 MG Well		Plant Tap									
	# Samples	Count	# Samples	# pos	# Samples	# pos	Raw	Tap	Tap	Raw	Raw	Tap	Raw	Tap
1	1	9208	1	0	1	0	1660	< 2	0.46	25.3				
2	1	6896	1	0	1	0	1940	< 2	0.39	25.0				
3	1	24066	1	0	1	0	4960	2	0.41	25.1				
4	1	9222	1	0	1	0	2240	< 2	0.38	25.6				
5	1	7746	1	0	1	0	3320	< 2	0.38	24.2				
6	1	4494	1	0	1	0	2080	2	0.40	24.4				
7	1	6152	1	0	1	0	3900	< 2	0.39	25.0				
8	1	6896	6	0	1	0	3660	< 2	0.38	24.7				
9	1	5510	6	0	1	0	3900	< 2	0.38	24.2				
10	1	9222	6	0	1	0	6220	< 2	0.38	24.7				
11	1	4978	6	0	1	0	5140	< 2	0.37	23.6				
12	1	4128	6	0	1	0	4040	< 2	0.39	23.7				
13	1	3348	6	0	1	0	3660	< 2	0.39	26.6				
14	1	5510	6	0	1	0	5140	< 2	0.40	24.4				
15	1	16328	6	0	1	0	12460	< 2	0.42	24.1				
16	1	6510	6	0	1	0	4960	< 2	0.41	24.9				
17	1	8704	6	0	1	0	3540	< 2	0.41	25.7				
18	1	8212	6	0	1	0	3540	< 2	0.40	25.8				
19	1	8212	6	0	1	0	4180	< 2	0.39	25.9				
20	1	17328	6	0	1	0	4460	< 2	0.41	25.1				
21	1	5526	6	0	1	0	2820	< 2	0.41	25.4				
22	1	6510	6	0	1	0	3540	< 2	0.40	23.7				
23	1	6152	6	0	1	0	3420	< 2	0.40	23.5				
24	1	11588	6	0	1	0	3020	< 2	0.41	23.4				
25	1	5818	6	0	1	0	1480	< 2	0.41	22.3				
26	1	20924	6	0	1	0	3220	< 2	0.39	21.8				
27	1	2548	6	0	1	0	2320	< 2	0.41	21.1				
28	1	2878	6	0	1	0	2080	< 2	0.40	20.4				
29	1	5226	6	0	1	0	4040	< 2	0.39	20.9				
30	1	1808	6	0	1	0	960	< 2	0.38	21.3				
31	1	2500	6	0	1	0	1600	< 2	0.40	21.9				

Avg.									0.40	24.0				
Max.		24066					12460	< 2	0.46	26.6				
Min.									0.37	20.4				

WSSN: 2310

Date	Free 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	0.9	1.4	1.8	0.1	0.1	0.1	0.5	1.8	0.8	2.0	10
4											0
5	0.4	1.2	1.3	0.2	0.1	0.1	0.5	1.1	0.5	1.5	10
6											0
7											0
8											0
9											0
10											0
11	0.9	1.2	1.2	1.0	0.3	0.2	1.0	1.6	1.1	1.5	10
12	0.1	1.4	1.7	1.2	0.6	0.3	0.5	1.7	1.3	1.9	10
13											0
14											0
15											0
16											0
17											0
18	1.0	1.0	1.4	1.0	0.4	0.2	0.8	1.8	1.0	1.9	10
19	0.1	1.0	1.3	0.9	0.2	0.2	0.1	1.2	1.0	1.5	10
20	0.8	1.3	1.4	0.7	0.6	0.2	0.8	1.3	1.1	1.6	10
21											0
22											0
23											0
24											0
25	0.4	1.2	1.5	0.6	0.4	0.3	0.5	1.5	0.7	1.1	10
26	0.1	1.2	1.3	1.0	0.3	0.1	0.5	1.3	1.4	1.8	10
27	0.1	1.3	1.5	1.0	0.4	0.2	0.2	1.5	1.7	2.3	10
28											0
29											0
30											0
31											0

Distribution Sample Summary

Total # of routine distribution samples analyzed	100
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	0
Percent of routine distribution samples positive	0%

See page 9 for positive sample information.

Distribution Disinfectant Total Residual Summary

Percentage of samples with a detectable disinfectant residual	100%
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Average disinfectant residual this month	0.92
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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	1.3	1.8	2.2	0.4	0.3	0.3	0.7	2.2	1.1	2.3	10
4											0
5	0.6	1.5	1.6	0.4	0.2	0.5	0.8	1.4	0.8	1.8	10
6											0
7											0
8											0
9											0
10											0
11	1.2	1.5	1.5	1.3	0.5	0.3	1.3	1.9	1.3	1.8	10
12	0.1	1.6	1.9	1.4	0.8	0.5	0.7	1.9	1.5	2.1	10
13											0
14											0
15											0
16											0
17											0
18	1.3	1.3	1.7	1.3	0.5	0.3	1.1	2.1	1.3	2.2	10
19	0.2	1.3	1.7	1.2	0.4	0.4	0.3	1.5	1.3	1.7	10
20	1.0	1.5	1.7	1.0	0.9	0.3	1.1	1.5	1.4	1.8	10
21											0
22											0
23											0
24											0
25	0.6	1.5	1.8	0.9	0.5	0.4	0.7	1.8	1.0	1.0	10
26	0.2	1.4	1.5	1.3	0.5	0.2	0.7	1.5	1.6	2.0	10
27	0.2	1.5	1.8	1.3	0.5	0.3	0.4	1.8	2.0	2.6	10
28											0
29											0
30											0
31											0

Distribution Disinfectant Total Residual Summary

Percent samples with a detectable disinfectant residual

100%

Average disinfectant residual this month

1.2

Positive Distribution Samples

[illegible]

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT

WSSN: 2310

Michael Glasgow

Operator-in-Charge

July 2015

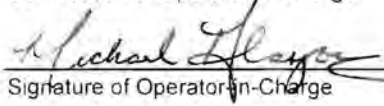
Month/Year

F-1R, F-2

Certification of Operator-in-Charge

F-1

Water Plant Classification


Signature of Operator-in-ChargeGenesee

County

DEQ

AUG 17 2015

LANSING DISTRICT

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?	<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.	

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[illegible]

Filter turbidity

City of Flint Water Treatment Plant

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Date	Turbidity, Units												
	Confluence Point, No. 1 (N) North						Confluence Point, No. 2 (S) South						Point of Entry
	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	Plant Tap 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	

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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	8.37	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	8.13	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 Parameters

City of Flint Water Treatment Plant

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	0.46	25.5				

Avg.									0.42	24.2				
Max.		19863					7380	< 2	0.48	27.6				
Min.									0.39	22.0				

WSSN: 2310

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

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	0.9	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]

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

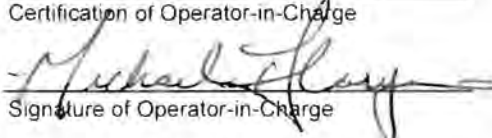
Month/Year

F-1R, F-2

Certification of Operator-in-Charge

F-1

Water Plant Classification


 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.		

WSSN: 2310

Date	Million Gallons Treated	Ozone Dosage (mg/L)	Ferric as Fe3+ mg/L	Lime Dosage (mg/L)	PW-340 Cationic Polymer Dosage (mg/L)	P-142PWG Anionic Polymer Dosage (mg/L)	Turbidity, Units				
							Raw			Plate Settler	Applied
							Number of Samples	Avg.	Max.	Effluent Avg	Applied Avg.
1	17.3	2.2	19.7	148.3	4.2	0.66	7	2.3	4.4	1.29	1.35
2	16.5	2.5	20.7	176.0	4.4	0.60	8	6.8	22.8	1.11	2.50
3	16.9	2.4	20.1	155.0	4.3	0.68	7	4.3	20.6	1.13	3.53
4	16.5	2.4	20.8	162.2	4.4	0.58	7	3.4	15.6	0.96	3.24
5	17.5	2.9	20.2	168.8	3.6	0.56	7	1.5	2.4	1.01	2.57
6	18.1	3.5	20.2	157.9	3.6	0.53	8	2.9	8.2	0.88	4.26
7	17.9	3.5	17.8	137.8	3.6	0.58	8	3.3	10.2	0.88	3.15
8	17.6	3.6	18.2	145.0	4.2	0.68	8	6.4	24.9	1.44	2.26
9	17.7	3.6	20.4	178.1	4.4	0.68	7	2.1	7.3	1.36	2.96
10	17.6	3.2	20.4	176.1	4.4	0.69	7	2.5	6.9	1.38	5.40
11	18.0	3.6	20.2	173.1	4.3	0.57	7	5.4	12.3	1.20	3.84
12	18.3	3.6	19.7	168.3	4.0	0.56	7	3.6	7.1	1.34	3.51
13	17.8	3.5	20.2	164.3	4.1	0.60	8	6.5	13.9	1.55	2.88
14	18.3	3.5	20.1	182.3	4.0	0.63	8	6.7	19.6	2.50	2.89
15	16.7	3.5	22.5	206.7	4.4	0.78	7	4.8	18.3	2.50	2.16
16	16.1	3.4	19.8	184.1	3.8	0.82	7	8.1	16.9	2.46	4.04
17	16.2	3.6	21.5	183.5	4.5	0.86	7	8.7	31.5	1.88	4.22
18	15.6	3.6	25.7	219.3	4.9	0.85	7	7.8	22.7	2.75	2.04
19	15.1	3.6	16.2	203.6	5.0	0.87	7	4.9	12.5	1.88	3.7
20	15.4	3.6	15.5	194.9	4.8	0.90	8	11.0	30.4	1.11	2.46
21	14.6	3.6	17.2	223.1	5.0	0.83	7	4.1	15.8	0.93	2.71
22	12.0	3.5	19.5	238.7	5.2	0.93	7	11.0	65.7	1.27	7.41
23	11.6	3.8	22.5	223.9	5.3	0.94	7	12.5	56.3	2.06	7.06
24	12.6	3.8	20.7	177.2	4.7	0.83	7	21.0	103.0	2.67	2.39
25	13.2	3.7	18.7	191.5	5.0	0.73	7	11.7	49.7	2.33	3.89
26	13.5	3.3	19.9	143.1	5.1	0.71	7	4.1	11.4	3.94	5.27
27	13.8	3.7	20.5	123.6	5.0	0.68	7	11.6	63.9	4.51	1.33
28	14.2	3.7	19.8	125.6	4.6	0.68	7	2.0	3.6	5.62	2.24
29	13.9	3.7	17.5	115.2	4.7	0.73	7	3.0	4.4	5.19	2.12
30	14.4	4.3	15.8	122.1	5.2	0.69	7	11.1	21.7	4.84	1.32

[illegible]

Filter turbidity

City of Flint Water Treatment Plant

June 2015

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Date	Turbidity, Units												
	Confluence Point. No 1 (N) North						Confluence Point. No 2 (S) South						Point of Entry
	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	Plant Tap 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 &
Chlorination

City of Flint Water Treatment Plant

June 2015

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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	0.5	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

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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
WSSN: 2310

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				

WSSN: 2310

Date	Free 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	0.1	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]

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANTWSSN: 2310Michael Glasgow

Operator-in-Charge

May 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>20.3</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>69</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>3.1</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>2.3</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>3.5%</u>	Percent of Treated Water

DEO
RESOURCE MANAGEMENT DIVISION

JUN 17 2015

LANSING DISTRICT

Chemical Data

Chlorine on hand:	<u>24,000</u> lb.	Est. supply:	<u>33</u> days
Primary Coagulant (Ferric Chloride) on hand:	<u>126,000</u> lb.	Est. supply:	<u>7</u> days
Lime (CaO) on hand:	<u>289</u> tons	Est. supply:	<u>24</u> days
Fluoride on Hand:	<u>15,000</u> lb.	Est. supply:	<u>40</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:

00

Number of filter confluence samples collected:

229229

Percent of filter confluence samples > 0.3 NTU:

0.0%0.0%

Number of filter confluence samples > 1 NTU:

00

Did any individual filter exceed:

1.0 NTU in two consecutive measurements taken 15 minutes apart?

NO

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?

NO

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?

NO

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?

NO

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.

[illegible]

Filter turbidity

City of Flint Water Treatment Plant

May 2015

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WSSN: 2310

Date	Turbidity, Units												
	Confluence Point. No.1 (N) North						Confluence Point. No.2 (S) South						Point of Entry
	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	Plant Tap NTU
1	8	0.07	0.09	6	0	0	8	0.07	0.08	6	0	0	0.07
2	8	0.06	0.09	6	0	0	8	0.06	0.08	6	0	0	0.06
3	8	0.07	0.11	6	0	0	8	0.07	0.08	6	0	0	0.07
4	8	0.08	0.09	6	0	0	8	0.07	0.09	6	0	0	0.07
5	7	0.08	0.09	6	0	0	7	0.07	0.08	6	0	0	0.07
6	7	0.08	0.11	6	0	0	7	0.08	0.12	6	0	0	0.08
7	6	0.08	0.11	6	0	0	6	0.07	0.09	6	0	0	0.07
8	7	0.07	0.08	6	0	0	7	0.08	0.09	6	0	0	0.07
9	8	0.08	0.09	6	0	0	8	0.07	0.08	6	0	0	0.07
10	8	0.06	0.08	6	0	0	8	0.06	0.07	6	0	0	0.06
11	7	0.06	0.06	6	0	0	7	0.06	0.09	6	0	0	0.06
12	7	0.08	0.12	6	0	0	7	0.07	0.09	6	0	0	0.08
13	7	0.07	0.09	6	0	0	7	0.07	0.09	6	0	0	0.06
14	7	0.06	0.08	6	0	0	7	0.07	0.12	6	0	0	0.06
15	6	0.06	0.07	6	0	0	6	0.06	0.11	6	0	0	0.07
16	7	0.07	0.09	6	0	0	7	0.07	0.08	6	0	0	0.07
17	7	0.07	0.09	6	0	0	7	0.06	0.07	6	0	0	0.07
18	4	0.07	0.09	5	0	0	4	0.06	0.07	5	0	0	0.07
19	8	0.07	0.09	5	0	0	8	0.07	0.09	5	0	0	0.08
20	8	0.07	0.08	4	0	0	8	0.07	0.08	4	0	0	0.08
21	7	0.06	0.07	6	0	0	7	0.06	0.07	6	0	0	0.08
22	7	0.07	0.12	6	0	0	7	0.07	0.08	6	0	0	0.07
23	8	0.08	0.18	6	0	0	8	0.07	0.08	6	0	0	0.08
24	8	0.08	0.10	6	0	0	8	0.08	0.11	6	0	0	0.08
25	8	0.07	0.09	6	0	0	8	0.06	0.08	6	0	0	0.07
26	8	0.08	0.10	6	0	0	8	0.08	0.10	6	0	0	0.08
27	8	0.08	0.11	6	0	0	8	0.08	0.09	6	0	0	0.08
28	8	0.09	0.11	6	0	0	8	0.08	0.09	6	0	0	0.11
29	8	0.10	0.18	6	0	0	8	0.08	0.10	6	0	0	0.09
30	7	0.09	0.12	6	0	0	7	0.09	0.13	6	0	0	0.11
31	7	0.08	0.11	6	0	0	7	0.08	0.10	6	0	0	0.10
Avg.	7	0.07	0.10	6	0	0	7	0.07	0.09	6	0	0	
Max.	8	0.10	0.18	6	0	0	8	0.09	0.13	6	0	0	0.11
Min.	4	0.06	0.06	4	0	0	4	0.06	0.07	4	0	0	

Fluoridation &
Chlorination

City of Flint Water Treatment Plant
WSSN: 2310

May 2015

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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	0.5	0.19	0.69		1.9	2.5	4.4	0.6	0.8	2.0	2.4	1.7	2.0
2	0.6	0.19	0.74		1.4	2.9	4.3	0.2	0.5	1.8	2.0	1.6	1.8
3	0.6	0.20	0.75		1.4	3.1	4.5	0.2	0.4	1.8	2.0	1.8	2.0
4	0.5	0.19	0.74		1.4	3.2	4.6	0.2	0.4	2.1	2.3	2.0	2.3
5	0.5	0.20	0.73		1.4	3.0	4.4	0.3	0.5	2.0	2.2	2.0	2.2
6	0.5	0.21	0.69	0.69	1.2	2.9	4.1	0.4	0.6	1.8	2.1	1.6	1.8
7	0.5	0.19	0.70		1.2	3.1	4.3	0.3	0.5	1.8	2.1	1.7	1.9
8	0.5	0.20	0.68		1.1	3.3	4.4	0.6	0.8	1.7	2.1	1.4	1.7
9	0.6	0.20	0.75		1.1	3.5	4.6	0.5	0.6	1.7	1.9	1.7	1.9
10	0.6	0.18	0.74		1.1	3.2	4.3	0.4	0.7	1.8	2.2	1.3	1.6
11	0.6	0.19	0.78		1.0	3.5	4.5	0.4	0.6	1.5	1.8	1.1	1.4
12	0.6	0.19	0.79		0.7	3.9	4.6	0.4	0.5	1.7	2.1	1.6	2.0
13	0.6	0.19	0.79	0.74	0.7	4.1	4.8	0.4	0.6	2.1	2.4	1.8	2.0
14	0.6	0.20	0.79		0.7	3.4	4.1	0.3	0.4	1.9	2.3	1.8	2.2
15	0.6	0.20	0.82		0.7	3.4	4.1	0.4	0.5	1.6	2.0	1.5	1.9
16	0.6	0.20	0.82		0.7	3.4	4.1	0.4	0.6	1.8	2.1	1.7	2.1
17	0.5	0.17	0.76		0.7	3.2	3.9	0.3	0.5	1.5	1.8	1.5	1.8
18	0.6	0.20	0.76		0.7	3.6	4.3	0.3	0.5	1.8	2.1	1.3	1.5
19	0.6	0.18	0.73		0.7	3.5	4.2	0.5	0.6	1.8	2.0	1.7	1.9
20	0.5	0.18	0.75	0.73	0.9	2.4	3.3	0.4	0.5	1.9	2.2	0.6	0.8
21	0.6	0.19	0.78		1.6	3.2	4.8	0.5	0.7	1.9	2.2	1.8	2.1
22	0.5	0.20	0.78		1.6	3.0	4.6	0.2	0.8	2.0	2.4	0.9	1.1
23	0.5	0.19	0.72		1.7	4.0	5.7	0.5	0.6	1.6	1.9	1.6	1.7
24	0.6	0.19	0.76		2.0	2.8	4.8	0.4	0.6	1.6	1.7	1.6	1.8
25	0.6	0.21	0.79		2.0	2.5	4.5	0.5	0.7	1.9	2.2	1.7	2.0
26	0.6	0.20	0.79		2.2	2.9	5.1	0.3	0.5	1.4	1.6	1.4	1.6
27	0.5	0.18	0.74	0.73	2.1	3.2	5.3	0.6	0.9	1.6	1.8	1.5	1.9
28	0.5	0.20	0.70		2.5	3.1	5.6	0.5	0.6	1.9	2.2	1.8	2.2
29	0.5	0.22	0.75		2.7	2.8	5.5	0.6	0.8	1.8	2.2	1.8	2.2
30	0.6	0.18	0.78		2.9	3.2	6.1	0.4	0.5	1.6	1.8	1.6	1.8
31	0.6	0.18	0.77		2.8	2.8	5.6	0.3	0.5	2.2	2.5	2.3	2.5

Avg.	0.56	0.19	0.75	0.72	1.4	3.2	4.6	0.4	0.6	1.8	2.1	1.6	1.9
Max.	0.60	0.22	0.82	0.74	2.9	4.1	6.1	0.6	0.9	2.2	2.5	2.3	2.5
Min.	0.50	0.17	0.68	0.69	0.7	2.4	3.3	0.2	0.4	1.4	1.6	0.6	0.8

Chemical
AnalysesCity of Flint Water Treatment Plant
WSSN: 2310

May 2015

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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	7.91	7.88	265	163	214	61	51	102	84.2	48.9	14.1	8.3	47	92
2	7.88	7.82	267	163	214	60	53	103	89.8	54.5	10.7	6.3	45	92
3	7.91	7.75	278	178	219	73	59	105	96.2	64.9	8.3	4.9	50	96
4	7.88	7.75	270	171	218	66	52	105	90.6	55.3	10.2	7.8	50	90
5	7.80	7.68	270	166	218	66	52	100	81.0	60.9	16.5	3.3	51	92
6	7.81	7.70	266	161	216	64	50	97	88.2	57.7	11.2	4.1	48	84
7	7.74	7.67	266	172	216	70	50	102	88.2	60.9	11.2	4.9	50	88
8	7.82	7.68	268	164	218	60	50	104	81.8	54.5	15.6	6.8	49	88
9	7.79	7.51	265	168	214	65	51	103	94.6	59.3	8.7	4.9	45	93
10	7.83	7.58	267	172	216	66	51	106	92.2	64.9	8.7	2.4	47	90
11	7.78	7.48	260	170	217	65	43	105	81.8	59.3	15.6	4.4	49	91
12	7.80	7.53	268	162	216	56	52	106	97.0	63.3	6.3	1.0	48	90
13	7.88	7.35	266	174	216	70	50	104	95.4	60.1	6.8	4.4	46	92
14	7.77	7.56	274	158	216	50	58	108	95.4	60.1	8.7	1.9	44	90
15	7.92	7.57	270	167	220	64	50	103	90.6	64.1	10.7	2.4	46	90
16	7.85	7.56	270	185	220	80	50	105	80.2	72.1	17.0	2.4	46	91
17	7.88	7.55	266	163	220	54	46	109	94.6	56.9	7.3	2.4	44	87
18	7.85	7.43	272	156	222	44	50	112	81.8	56.9	16.5	3.4	47	91
19	7.89	7.54	278	175	219	64	59	111	94.6	63.3	10.7	3.0	46	88
20	7.87	7.63	275	176	218	74	57	102	82.6	69.7	17.5	1.9	45	90
21	7.85	7.53	276	159	220	52	56	107	78.6	56.9	18.9	4.9	46	92
22	7.94	7.45	272	148	218	40	54	108	90.6	54.5	11.2	2.9	47	93
23	7.86	7.44	276	168	217	54	59	114	94.6	60.9	9.7	3.9	46	93
24	7.92	7.51	275	175	215	63	60	112	96.2	65.7	8.7	2.4	46	89
25	7.94	7.65	275	170	221	58	54	112	94.6	64.9	9.7	2.9	46	91
26	7.90	7.57	276	177	224	68	52	109	85.8	61.7	15.1	5.3	47	93
27	7.87	7.61	278	161	224	54	54	107	81.0	57.7	18.4	4.4	47	91
28	8.20	7.60	279	175	233	71	46	104	97.0	60.1	8.3	5.8	46	86
29	8.25	7.60	274	164	220	64	54	100	80.2	56.9	18.0	5.3	51	90
30	8.21	7.68	278	192	222	86	56	106	94.6	64.9	10.2	6.8	47	85
31	8.17	7.69	275	182	220	68	55	114	93.0	60.1	11.2	8.3	45	84

Avg.	7.90	7.60	271	169	219	63	53	106	89.3	60.4	12.0	4.3	47	90
Max.	8.25	7.88	279	192	233	86	60	114	97.0	72.1	18.9	8.3	51	96
Min.	7.74	7.35	260	148	214	40	43	97	78.6	48.9	6.3	1.0	44	84

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
WSSN: 2310

May 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	70	12	0	1	0	195	< 2	0.46	11.1				
2	1	61	12	0	1	0	239	< 2	0.45	11.9				
3	1	79	12	0	1	0	248	< 2	0.48	12.7				
4	1	88	12	0	1	0	202	< 2	0.46	14.3				
5	1	67	12	0	1	0	202	< 2	0.46	14.3				
6	1	86	12	0	1	0	231	< 2	0.46	13.9				
7	1	88	12	0	1	0	372	< 2	0.48	14.5				
8	1	142	12	1	1	0	392	< 2	0.46	14.4				
9	1	199	12	0	1	0	555	< 2	0.50	15.7				
10	1	138	12	1	1	0	440	< 2	0.47	15.7				
11	1	548	12	0	1	0	299	< 2	0.46	15.9				
12	1	921	12	3	1	0	738	< 2	0.46	15.4				
13	1	253	12	1	1	0	260	< 2	0.50	14.9				
14	1	225	12	6	1	0	738	< 2	0.44	14.7				
15	1	365	12	6	1	0	> 738	< 2	0.48	14.9				
16	1	722	12	4	1	0	> 738	< 2	0.47	15.1				
17	1	225	12	6	1	0	> 738	< 2	0.41	16.6				
18	1	262	12	2	1	0	2400	< 2	0.44	16.5				
19	1	292	12	2	1	0	1940	< 2	0.46	16.4				
20	1	134	12	0	1	0	830	< 2	0.46	16.2				
21	1	185	12	0	1	0	1160	< 2	0.47	15.8				
22	1	328	12	0	1	0	324	< 2	0.44	15.7				
23	1	199	12	0	1	0	150	< 2	0.48	16.7				
24	1	199	12	0	1	0	400	< 2	0.47	17.6				
25	1	272	12	0	1	0	590	< 2	0.46	17.0				
26	1	218	12	0	1	0	510	< 2	0.46	17.8				
27	1	365	12	0	1	0	470	< 2	0.43	18.3				
28	1	980	12	0	1	0	555	< 2	0.47	20.9				
29	1	909	12	0	1	0	1120	< 2	0.47	21.4				
30	1	5794	12	0	1	0	1040	< 2	0.49	22.7				
31	1	4884	12	0	1	0	1000	< 2	0.49	20.1				

Avg.									0.46	16.1				
Max.		5794					2400	< 2	0.50	22.7				
Min.									0.41	11.1				

WSSN: 2310

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
4											0
5	0.4	1.0	1.2	1.1	0.8	0.4	0.5	1.5	0.3	1.5	10
6	0.3	1.1	1.2	1.0	0.6	0.3	0.4	1.6	0.7	1.3	10
7	0.5	0.8	1.0	0.8	0.5	0.7	0.4	1.5	0.2	1.2	10
8											0
9											0
10											0
11											0
12	0.6	0.7	1.0	0.6	0.1	0.6	0.7	1.3	0.1	1.2	10
13	0.1	0.8	1.0	0.8	0.6	0.4	0.6	1.1	0.7	1.0	10
14	1.5	1.2	1.0	1.0	0.5	0.4	1.0	1.4	0.1	1.3	10
15											0
16											0
17											0
18	1.2	1.0	0.9	0.7	0.4	0.2	0.7	1.1	0.6	1.1	10
19											0
20	1.0	0.9	1.3	1.0	0.2	0.3	0.9	1.3	0.7	0.1	10
21											0
22											0
23											0
24											0
25											0
26	0.3	0.6	1.0	0.8	0.4	0.3	0.6	1.3	0.6	1.0	10
27	0.2	0.6	1.0	0.7	0.3	0.3	0.5	1.2	0.4	0.3	10
28											0
29											0
30											0
31											0

Distribution Sample Summary

Total # of routine distribution samples analyzed	100
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	0
Percent of routine distribution samples positive	0%

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	0.76

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
4											0
5	0.6	1.2	1.5	1.4	1.0	0.7	0.7	1.8	0.5	1.8	10
6	0.5	1.4	1.5	1.3	1.0	0.5	0.6	1.8	1.0	1.6	10
7	0.8	1.0	1.3	1.0	0.8	1.0	0.7	1.7	0.4	1.4	10
8											0
9											0
10											0
11											0
12	0.9	1.0	1.3	1.0	0.2	0.7	0.9	1.5	0.2	1.5	10
13	0.3	1.0	1.3	1.0	0.8	0.6	0.8	1.3	1.0	1.3	10
14	1.8	1.5	1.4	1.3	0.7	0.6	1.3	1.7	0.3	1.7	10
15											0
16											0
17											0
18	1.6	1.4	1.3	1.0	0.6	0.4	0.9	1.5	0.9	1.4	10
19											0
20	1.4	1.3	1.7	1.3	0.5	0.5	1.1	1.5	1.1	0.4	10
21											0
22											0
23											0
24											0
25											0
26	0.4	1.0	1.4	1.1	0.7	0.4	0.9	1.6	0.9	1.4	10
27	0.4	1.0	1.2	1.0	0.5	0.4	0.7	1.4	0.5	0.5	10
28											0
29											0
30											0
31											0

Distribution Disinfectant Total Residual Summary	
Percent samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	1.0

Positive Distribution Samples

[illegible]

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT
 WSSN: 2310

Michael Glasgow

Operator-in-Charge

April 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

DEQ
 RESOURCE MANAGEMENT DIVISION
 MAY 18 2015
 LANSING DISTRICT

Treatment Rate and Filter Data

Maximum Treatment Rate:	<u>21.1</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>126</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>2.4</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>3.0</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>1.1%</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>24,000</u>	lb.	Est. supply:	<u>35</u>	days
Primary Coagulant (Ferric Chloride) on hand:	<u>221,000</u>	lb.	Est. supply:	<u>12</u>	days
Lime (CaO) on hand:	<u>383</u>	tons	Est. supply:	<u>31</u>	days
Fluoride on Hand:	<u>13,300</u>	lb.	Est. supply:	<u>36</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>232</u>	<u>232</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

April 2015

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WSSN: 2310

Date	Turbidity, Units												
	Confluence Point. No.1 (N) North						Confluence Point. No.2 (S) South						Point of Entry
	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	Plant Tap NTU
1	8	0.09	0.12	6	0	0	8	0.07	0.09	6	0	0	0.10
2	8	0.09	0.12	6	0	0	8	0.07	0.08	6	0	0	0.09
3	8	0.08	0.10	6	0	0	8	0.08	0.11	6	0	0	0.09
4	8	0.08	0.09	6	0	0	8	0.09	0.10	6	0	0	0.08
5	8	0.08	0.10	6	0	0	8	0.07	0.08	6	0	0	0.08
6	8	0.08	0.10	6	0	0	8	0.08	0.10	6	0	0	0.08
7	8	0.10	0.19	6	0	0	8	0.07	0.09	6	0	0	0.07
8	8	0.10	0.15	6	0	0	8	0.07	0.08	6	0	0	0.07
9	8	0.10	0.14	6	0	0	8	0.07	0.08	6	0	0	0.07
10	8	0.10	0.17	6	0	0	8	0.07	0.10	6	0	0	0.07
11	8	0.08	0.10	6	0	0	8	0.07	0.08	6	0	0	0.08
12	8	0.07	0.11	6	0	0	8	0.07	0.11	6	0	0	0.08
13	8	0.07	0.11	6	0	0	7	0.07	0.11	6	0	0	0.07
14	7	0.07	0.09	6	0	0	7	0.07	0.09	6	0	0	0.07
15	7	0.08	0.11	6	0	0	8	0.08	0.10	6	0	0	0.07
16	8	0.09	0.15	6	0	0	7	0.08	0.11	6	0	0	0.07
17	7	0.09	0.13	6	0	0	8	0.08	0.10	6	0	0	0.08
18	8	0.08	0.10	6	0	0	8	0.07	0.08	6	0	0	0.08
19	8	0.09	0.11	6	0	0	8	0.08	0.10	6	0	0	0.08
20	8	0.09	0.14	6	0	0	8	0.09	0.14	6	0	0	0.08
21	7	0.10	0.13	6	0	0	7	0.08	0.09	6	0	0	0.09
22	7	0.10	0.11	6	0	0	7	0.08	0.10	6	0	0	0.10
23	8	0.08	0.10	6	0	0	8	0.07	0.09	6	0	0	0.07
24	8	0.07	0.09	6	0	0	8	0.07	0.10	6	0	0	0.07
25	8	0.08	0.09	6	0	0	8	0.08	0.09	6	0	0	0.07
26	8	0.07	0.09	6	0	0	8	0.07	0.11	6	0	0	0.08
27	8	0.07	0.10	6	0	0	8	0.07	0.09	6	0	0	0.07
28	8	0.07	0.11	6	0	0	8	0.07	0.08	6	0	0	0.08
29	7	0.09	0.14	6	0	0	7	0.07	0.09	6	0	0	0.07
30	7	0.08	0.09	6	0	0	7	0.07	0.08	6	0	0	0.07
Avg.	8	0.08	0.12	6	0	0	8	0.07	0.09	6	0	0	
Max.	8	0.10	0.19	6	0	0	8	0.09	0.14	6	0	0	0.10
Min.	7	0.07	0.09	6	0	0	7	0.07	0.08	6	0	0	

Fluoridation &
Chlorination

City of Flint Water Treatment Plant
WSSN: 2310

April 2015

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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	0.4	0.17	0.62	0.61	2.1	2.6	4.7	0.6	0.9	2.5	3.1	2.0	2.7
2	0.5	0.16	0.68		1.9	2.5	4.4	0.5	0.7	2.5	2.9	2.0	2.2
3	0.5	0.15	0.66		1.9	2.7	4.6	0.6	0.7	2.5	3.1	2.0	2.6
4	0.5	0.16	0.64		1.9	2.7	4.6	0.6	0.8	2.5	3.1	2.1	2.6
5	0.5	0.15	0.65		1.9	2.7	4.6	0.5	0.7	2.5	2.7	2.4	2.7
6	0.5	0.16	0.65		1.9	2.6	4.5	0.5	0.8	2.8	3.1	2.0	2.5
7	0.5	0.15	0.65		1.9	2.7	4.6	0.4	0.5	2.6	3.0	2.3	2.7
8	0.5	0.17	0.68	0.63	1.9	2.8	4.7	0.5	0.8	2.2	2.5	1.8	2.2
9	0.5	0.15	0.64		1.8	2.6	4.4	0.5	0.7	2.2	2.6	2.1	2.4
10	0.5	0.16	0.65		1.9	2.4	4.3	0.5	0.6	2.3	2.7	1.5	1.8
11	0.5	0.16	0.71		1.9	2.4	4.3	0.5	0.6	2.3	2.7	2.2	2.4
12	0.5	0.15	0.71		1.9	2.0	3.9	0.5	0.7	1.7	1.9	1.8	2.0
13	0.5	0.15	0.67		1.9	2.4	4.3	0.2	0.4	1.8	2.0	1.6	1.9
14	0.5	0.17	0.74		2.0	2.3	4.3	0.6	0.8	2.1	2.3	2.1	2.3
15	0.5	0.16	0.68	0.66	1.9	2.1	4.0	0.5	0.7	1.9	2.2	1.7	2.0
16	0.5	0.19	0.67		1.8	2.3	4.1	0.3	0.5	1.9	2.2	1.7	1.8
17	0.5	0.18	0.69		1.9	2.4	4.3	0.6	0.7	2.1	2.4	1.4	1.7
18	0.5	0.16	0.73		2.0	2.3	4.3	0.3	0.4	1.8	2.1	1.9	2.1
19	0.5	0.18	0.74		2.1	2.3	4.4	0.3	0.5	1.8	2.2	1.9	2.3
20	0.5	0.17	0.65		2.2	2.4	4.6	0.4	0.6	1.9	2.2	1.9	2.2
21	0.5	0.19	0.67		2.2	2.5	4.7	0.4	0.6	2.0	2.4	1.9	2.2
22	0.5	0.18	0.67	0.65	2.2	2.3	4.5	0.4	0.6	2.0	2.2	1.9	2.2
23	0.5	0.19	0.72		2.3	2.4	4.7	0.5	0.8	2.1	2.4	2.0	2.4
24	0.5	0.19	0.67		2.2	2.1	4.3	0.8	1.0	2.0	2.4	1.6	1.8
25	0.5	0.19	0.72		2.2	2.3	4.5	0.5	0.7	2.0	2.3	1.9	2.2
26	0.5	0.17	0.65		2.2	2.3	4.5	0.7	0.9	2.1	2.4	2.1	2.3
27	0.5	0.17	0.72		2.1	2.3	4.4	0.6	0.8	2.0	2.2	1.8	2.1
28	0.5	0.18	0.73		2.1	2.4	4.5	0.6	0.8	2.0	2.2	1.9	2.2
29	0.5	0.19	0.72		2.1	2.4	4.5	0.4	0.7	2.0	2.3	2.0	2.3
30	0.5	0.17	0.70	0.65	2.2	2.3	4.5	0.4	0.6	1.9	2.1	1.8	2.0

Avg.	0.50	0.17	0.68	0.64	2.0	2.4	4.4	0.5	0.7	2.1	2.5	1.9	2.2
Max.	0.50	0.19	0.74	0.66	2.3	2.8	4.7	0.8	1.0	2.8	3.1	2.4	2.7
Min.	0.40	0.15	0.62	0.61	1.8	2.0	3.9	0.2	0.4	1.7	1.9	1.4	1.7

Chemical
Analyses

City of Flint Water Treatment Plant

April 2015

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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	8.07	7.73	227	158	176	64	51	94	80.2	55.3	6.8	4.9	32	69
2	8.16	7.76	232	159	183	61	49	98	72.9	49.7	12.2	8.7	32	71
3	8.17	7.73	228	155	182	59	46	96	79.4	56.1	7.8	3.4	32	70
4	8.12	7.81	228	153	180	60	48	93	81.8	55.3	6.3	2.9	33	70
5	7.98	7.89	230	153	179	68	51	85	75.4	48.9	10.2	7.8	34	76
6	8.05	7.99	228	159	183	60	45	99	85.0	56.1	4.4	4.9	31	71
7	8.05	7.54	229	165	186	59	43	106	80.2	54.5	6.8	8.3	33	76
8	7.96	7.81	231	151	188	57	43	94	72.9	45.7	12.6	9.2	33	68
9	7.94	7.78	229	155	185	60	44	95	77.4	56.9	7.8	3.4	33	67
10	8.04	7.86	230	142	184	69	46	73	80.2	51.3	7.8	3.9	33	67
11	7.99	7.79	231	157	188	64	43	93	71.3	49.7	12.6	9.2	33	69
12	8.03	7.82	237	150	189	55	48	95	77.0	44.9	10.2	9.2	36	71
13	8.02	7.83	242	160	197	66	45	94	77.8	46.5	11.2	9.7	33	69
14	7.95	8.00	242	156	198	64	44	92	81.8	48.9	9.2	8.3	38	74
15	7.95	7.99	252	154	196	68	56	86	78.6	50.5	13.6	6.8	39	70
16	8.36	7.88	271	170	217	81	54	89	92.2	53.7	10.2	7.3	41	67
17	8.35	8.00	270	186	220	90	50	96	85.8	60.9	13.6	8.3	41	77
18	8.36	7.99	274	184	219	84	55	100	90.6	57.7	12.2	9.2	40	76
19	8.34	8.02	272	185	223	78	49	107	81.8	55.3	15.6	10.7	38	75
20	8.30	7.98	268	197	224	92	44	105	90.6	68.1	9.7	5.8	38	80
21	8.26	7.63	264	194	220	94	44	100	91.4	69.7	8.7	4.9	42	82
22	8.32	7.88	274	196	216	90	58	106	95.4	72.1	8.7	3.9	44	85
23	8.39	7.69	267	173	221	68	46	105	91.4	58.5	9.2	5.8	45	85
24	8.36	7.78	274	173	220	75	54	98	90.6	62.5	11.7	4.9	44	83
25	8.25	7.65	267	180	216	61	51	119	89.0	60.1	10.7	9.2	41	82
26	8.14	7.79	268	153	214	52	54	101	93.0	49.7	9.2	6.8	43	77
27	8.03	7.99	272	161	213	64	59	97	89.8	50.5	11.2	7.8	44	76
28	7.95	7.72	266	172	215	64	51	108	90.6	57.7	9.7	6.3	44	86
29	8.08	7.87	268	176	216	74	52	102	88.2	58.5	11.7	7.3	46	84
30	7.93	7.83	268	182	208	64	60	118	89.8	60.9	10.7	7.3	45	92

Avg.	8.13	7.83	251	167	202	69	49	98	84.1	55.5	10.1	6.9	38	76
Max.	8.39	8.02	274	197	224	94	60	119	95.4	72.1	15.6	10.7	46	92
Min.	7.93	7.54	227	142	176	52	43	73	71.3	44.9	4.4	2.9	31	67

Date	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l										
	1	2	3	4	5	6	7	8	CS	WS	Number of Samples
1	2.0	2.0	1.8	1.7	1.3	0.5	1.5	2.5		2.1	9
2	0.8	1.4	2.2	1.6	1.1	0.7	0.9	2.3		2.3	9
3											0
4											0
5											0
6											0
7	1.1	1.8	1.8	2.0	1.1	0.6	1.4	2.0		1.2	9
8	0.7	0.6	1.7	2.1	1.3	0.6	0.7	2.2		1.7	9
9	0.8	2.4	1.8	1.9	1.2	0.5	1.1	2.0		1.9	9
10											0
11											0
12											0
13											0
14	0.5	1.2	1.2	1.2	0.5	0.5	1.0	1.7		1.6	9
15	0.4	0.5	1.2	1.3	0.8	0.4	1.0	1.6		1.0	9
16											0
17											0
18											0
19											0
20											0
21	0.3	0.3	1.1	1.3	1.0	0.3	0.9	1.4	1.9	1.3	10
22	0.3	0.5	1.0	1.1	0.9	0.3	0.2	1.6	0.8	1.5	10
23											0
24											0
25											0
26											0
27									1.1	1.5	2
28											0
29	0.4	0.5	1.3	1.3	0.8	0.5	1.0	1.8	1.0	1.5	10
30	0.4	1.5	1.5	1.4	0.8	0.9	1.2	1.9	0.6	1.5	10
31											0

Distribution Sample Summary

Total # of routine distribution samples analyzed	105
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	0
Percent of routine distribution samples positive	0%

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	1.21

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	2.4	2.3	2.2	2.2	1.6	0.9	1.8	2.8		2.3	9
2	1.3	1.6	2.5	1.8	1.3	0.8	1.2	2.6		2.7	9
3											0
4											0
5											0
6											0
7	1.4	2.1	2.1	2.3	1.4	0.8	1.8	2.4		1.5	9
8	1.1	0.9	2.2	2.5	1.5	0.8	0.9	2.4		2.2	9
9	1.0	2.7	2.1	2.2	1.6	0.8	1.4	2.3		2.2	9
10											0
11											0
12											0
13											0
14	0.7	1.5	1.5	1.5	0.8	0.8	1.3	2.0		1.9	9
15	0.7	0.8	1.5	1.6	1.1	0.6	1.3	1.9		1.3	9
16											0
17											0
18											0
19											0
20											0
21	0.6	0.5	1.5	1.6	1.2	0.5	1.2	1.7	2.1	1.6	10
22	0.6	0.8	1.3	1.4	1.1	0.4	0.4	1.9	1.1	1.8	10
23											0
24											0
25											0
26											0
27									1.3	1.9	2
28											0
29	0.6	0.7	1.6	1.6	1.0	0.8	1.3	2.2	1.2	1.8	10
30	0.8	1.8	1.8	1.7	1.1	1.2	1.4	2.1	0.8	1.8	10
31											0

Distribution Disinfectant Total Residual Summary

Percent samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	1.5

Positive Distribution Samples

[illegible]

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT
 WSSN: 2310

Michael Glasgow
 Operator-in-Charge

March 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

APR 24 2015

Treatment Rate and Filter Data

Maximum Treatment Rate:	<u>25.4</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>96</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>1.3%</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>20,000</u>	lb.	Est. supply:	<u>19</u>	days
Primary Coagulant (Ferric Chloride) on hand:	<u>157,700</u>	lb.	Est. supply:	<u>9</u>	days
Lime (CaO) on hand:	<u>348</u>	tons	Est. supply:	<u>29</u>	days
Fluoride on Hand:	<u>23,300</u>	lb.	Est. supply:	<u>48</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>2</u>	<u>4</u>
Number of filter confluence samples collected:	<u>242</u>	<u>242</u>
Percent of filter confluence samples > 0.3 NTU:	<u>0.8%</u>	<u>1.7%</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.		

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Filter turbidity

City of Flint Water Treatment Plant

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Date	Turbidity, Units												
	Confluence Point, No.1 (N) North						Confluence Point, No.2 (S) South						Point of Entry
	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	Plant Tap NTU
1	8	0.15	0.18	6	0	0	8	0.11	0.15	6	0	0	0.16
2	8	0.10	0.15	6	0	0	8	0.09	0.14	6	0	0	0.11
3	8	0.11	0.16	6	0	0	8	0.11	0.18	6	0	0	0.11
4	8	0.14	0.20	6	0	0	8	0.12	0.18	6	0	0	0.14
5	8	0.16	0.20	6	0	0	8	0.11	0.17	6	0	0	0.12
6	8	0.11	0.20	6	0	0	8	0.15	0.29	6	0	0	0.16
7	8	0.09	0.13	6	0	0	8	0.07	0.09	6	0	0	0.12
8	8	0.14	0.19	6	0	0	8	0.11	0.18	6	0	0	0.13
9	8	0.12	0.20	6	0	0	8	0.10	0.14	6	0	0	0.13
10	8	0.10	0.13	6	0	0	8	0.13	0.17	6	0	0	0.12
11	8	0.12	0.18	6	0	0	8	0.09	0.11	6	0	0	0.11
12	8	0.12	0.16	6	0	0	8	0.10	0.13	6	0	0	0.11
13	8	0.10	0.12	6	0	0	8	0.12	0.15	6	0	0	0.11
14	8	0.11	0.15	6	0	0	8	0.08	0.09	6	0	0	0.10
15	8	0.12	0.17	6	0	0	8	0.14	0.20	6	0	0	0.14
16	8	0.15	0.17	6	0	0	8	0.14	0.17	6	0	0	0.17
17	8	0.11	0.18	6	0	0	8	0.09	0.12	6	0	0	0.16
18	2	0.07	0.07	1	0	0	2	0.07	0.07	1	0	0	0.08
19	8	0.14	0.22	6	0	0	8	0.14	0.22	6	0	0	0.19
20	8	0.27	0.35	6	1	2	8	0.29	0.36	6	3	4	0.42
21	8	0.15	0.16	6	0	0	8	0.15	0.20	6	0	0	0.33
22	8	0.20	0.23	6	0	0	8	0.18	0.20	6	0	0	0.35
23	8	0.19	0.23	6	0	0	8	0.17	0.23	6	0	0	0.37
24	8	0.19	0.20	6	0	0	8	0.16	0.18	6	0	0	0.23
25	8	0.16	0.21	6	0	0	8	0.12	0.15	6	0	0	0.14
26	8	0.17	0.22	6	0	0	8	0.10	0.12	6	0	0	0.15
27	8	0.13	0.16	6	0	0	8	0.14	0.24	6	0	0	0.13
28	8	0.11	0.17	6	0	0	8	0.10	0.12	6	0	0	0.09
29	8	0.09	0.13	6	0	0	8	0.09	0.12	6	0	0	0.07
30	8	0.09	0.12	6	0	0	8	0.08	0.09	6	0	0	0.10
31	8	0.07	0.09	6	0	0	8	0.08	0.12	6	0	0	0.11
Avg.	8	0.13	0.17	6	0	0	8	0.12	0.16	6	0	0	
Max.	8	0.27	0.35	6	1	2	8	0.29	0.36	6	3	4	0.42
Min.	2	0.07	0.07	1	0	0	2	0.07	0.07	1	0	0	

Fluoridation &
ChlorinationCity of Flint Water Treatment Plant
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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	0.3	0.24	0.60		2.3	2.5	4.8	0.6	0.7	2.4	2.7	1.9	2.1
2	0.3	0.25	0.62		2.2	2.6	4.8	0.4	0.6	2.5	2.8	2.0	2.4
3	0.3	0.23	0.57	0.55	2.2	2.8	5.0	0.6	0.7	2.5	2.9	2.0	2.5
4	0.3	0.24	0.59		2.3	2.6	4.9	0.5	0.7	2.3	2.9	2.1	2.3
5	0.3	0.22	0.57		2.2	2.5	4.7	0.5	0.7	2.7	3.1	2.3	2.8
6	0.3	0.25	0.58		2.2	2.3	4.5	0.4	0.6	2.5	3.0	1.9	2.5
7	0.3	0.23	0.56		2.2	2.8	5.0	0.4	0.7	2.3	2.7	1.8	2.3
8	0.3	0.23	0.61		2.2	2.8	5.0	0.6	0.8	2.5	2.8	2.5	2.8
9	0.3	0.26	0.64		2.2	2.8	5.0	0.5	0.7	2.5	2.8	2.5	2.8
10	0.3	0.23	0.56		2.7	2.9	5.6	0.4	0.6	2.6	3.2	2.2	2.7
11	0.3	0.23	0.52		2.2	3.0	5.2	0.6	0.8	2.4	2.7	2.2	2.6
12	0.3	0.23	0.53	0.50	2.3	2.9	5.2	0.4	0.6	2.8	3.1	2.3	2.7
13	0.3	0.24	0.54		2.3	2.9	5.2	0.4	0.7	2.6	3.3	2.0	2.5
14	0.3	0.24	0.52		2.3	2.7	5.0	0.6	0.8	3.2	3.5	2.0	2.4
15	0.3	0.21	0.49		2.3	3.4	5.7	1.0	1.4	1.7	2.0	1.8	2.0
16	0.3	0.19	0.52		2.5	4.9	7.4	1.6	1.9	2.0	2.3	2.0	2.2
17	0.3	0.21	0.54		2.4	4.3	6.7	0.6	1.0	2.8	3.1	2.5	3.1
18	0.3	0.21	0.51	0.52	2.3	3.4	5.7	0.3	0.5	3.0	3.5	3.0	3.5
19	0.3	0.20	0.52		2.4	3.2	5.6	0.6	1.1	3.0	3.3	2.5	2.8
20	0.3	0.17	0.55		2.2	3.9	6.1	0.3	1.0	2.9	3.3	1.3	1.6
21	0.3	0.17	0.48		2.5	4.1	6.6	0.6	1.3	2.6	3.3	1.7	2.3
22	0.3	0.14	0.51		2.7	3.7	6.4	0.5	1.4	2.6	2.9	2.5	2.8
23	0.3	0.16	0.55		2.7	3.6	6.3	0.5	1.3	2.6	3.0	2.6	2.9
24	0.4	0.16	0.58		2.9	3.5	6.4	0.3	0.8	2.7	3.2	2.5	2.9
25	0.4	0.17	0.62	0.53	2.8	3.4	6.2	0.3	0.7	2.5	2.9	2.3	3.0
26	0.4	0.15	0.56		2.8	3.3	6.1	0.3	0.5	2.8	3.3	2.4	2.8
27	0.5	0.19	0.64		2.9	3.1	6.0	0.3	0.5	2.5	3.1	2.0	2.6
28	0.5	0.16	0.66		2.9	2.8	5.7	0.6	0.8	3.0	3.5	2.3	3.0
29	0.5	0.14	0.59		2.9	2.8	5.7	0.5	0.7	2.7	3.1	2.5	3.0
30	0.4	0.18	0.66		2.5	2.5	5.0	0.8	1.0	2.6	3.0	2.6	3.0
31	0.5	0.17	0.65		2.1	2.6	4.7	0.5	0.7	2.4	2.7	2.0	2.3

Avg.	0.34	0.20	0.57	0.53	2.4	3.1	5.6	0.5	0.8	2.6	3.0	2.2	2.6
Max.	0.50	0.26	0.66	0.55	2.9	4.9	7.4	1.6	1.9	3.2	3.5	3.0	3.5
Min.	0.30	0.14	0.48	0.50	2.1	2.3	4.5	0.3	0.5	1.7	2.0	1.3	1.6

Chemical Analyses

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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	8.27	8.09	366	229	297	122	69	107	113.0	72.1	20.4	11.2	51	89
2	7.95	8.06	358	243	295	111	63	132	110.6	68.9	20.4	18.5	52	88
3	7.95	7.74	360	234	297	122	63	112	116.2	71.3	16.5	14.1	52	87
4	7.81	7.82	354	243	285	129	69	114	129.1	89.8	8.3	4.4	54	85
5	7.97	7.77	360	235	290	126	70	109	117.0	71.3	16.5	13.6	54	95
6	7.55	7.69	362	239	288	124	74	115	133.1	89.0	7.3	2.9	55	89
7	7.90	7.94	351	234	288	124	63	110	126.7	87.4	18.0	13.6	54	87
8	7.93	8.26	363	235	288	123	75	112	120.2	74.5	15.6	11.7	48	87
9	7.96	7.84	357	237	286	125	71	112	116.2	74.5	16.5	12.2	57	95
10	8.01	8.08	349	233	273	129	76	104	122.6	81.0	10.7	7.3	64	98
11	7.92	8.29	347	233	281	117	66	116	115.4	72.1	13.6	11.2	61	95
12	8.00	7.94	345	233	279	127	66	106	125.0	84.2	8.7	5.3	54	91
13	8.07	7.92	348	235	282	127	66	108	126.7	84.2	7.8	5.3	54	88
14	7.99	8.11	343	226	273	112	70	114	123.4	81.8	8.7	3.9	54	85
15	8.00	8.15	309	210	236	99	73	111	97.0	65.7	17.5	12.6	51	87
16	8.00	7.97	251	176	198	78	53	98	79.4	50.5	15.1	12.2	42	76
17	7.99	7.66	305	191	242	92	63	99	97.8	55.3	14.1	11.7	46	76
18	8.00	7.95	270	203	223	104	47	99	89.0	72.1	12.6	4.4	46	84
19	7.90	9.90	256	151	204	58	52	93	79.4	38.5	15.6	12.2	41	78
20	7.85	7.30	240	240	189	135	51	105	81.8	87.4	8.7	5.3	38	70
21	7.97	7.34	214	210	175	119	39	91	78.6	81.8	5.3	1.5	34	73
22	7.95	7.37	219	211	173	104	46	107	63.3	60.9	15.6	14.1	33	69
23	8.01	7.53	212	187	173	92	39	95	64.9	59.3	12.6	9.7	34	69
24	7.94	7.45	211	170	171	77	40	93	74.5	59.3	6.3	5.3	33	69
25	8.01	7.80	218	173	172	77	46	96	67.3	56.1	11.7	9.2	32	72
26	8.03	7.72	214	171	173	78	41	93	71.3	59.3	9.7	5.3	31	69
27	8.02	7.67	215	168	174	77	41	91	75.4	60.1	6.8	4.4	31	68
28	8.05	7.73	218	169	174	77	44	92	78.6	63.3	5.8	1.5	30	72
29	8.12	7.95	229	177	182	80	47	97	71.3	53.7	12.6	9.7	31	73
30	8.18	7.85	229	171	182	79	47	92	73.7	53.7	11.7	8.7	34	71
31	8.08	7.80	228	168	183	70	45	98	68.9	52.1	13.6	10.7	33	72

Avg.	7.98	7.89	290	208	233	104	57	104	97.0	68.7	12.4	8.8	45	81
Max.	8.27	9.90	366	243	297	135	76	132	133.1	89.8	20.4	18.5	64	98
Min.	7.55	7.30	211	151	171	58	39	91	63.3	38.5	5.3	1.5	30	68

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
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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	155	12	0	1	0	120	< 2	0.60	2.2				
2	1	135	12	0	1	0	146	< 2	0.60	2.8				
3	1	214	12	0	1	0	83	< 2	0.58	1.0				
4	1	84	12	0	1	0	100	< 2	0.61	2.5				
5	1	118	12	0	1	0	120	< 2	0.64	1.2				
6	1	79	12	0	1	0	43	< 2	0.62	1.5				
7	1	162	12	0	1	0	51	< 2	0.60	1.7				
8	1	86	12	0	1	0	100	< 2	0.62	2.6				
9	1	225	12	0	1	0	189	< 2	0.64	2.0				
10	1	205	12	0	1	0	248	< 2	0.64	2.6				
11	1	387	12	0	1	0	339	< 2	0.61	3.2				
12	1	770	12	0	1	0	440	< 2	0.31	3.7				
13	1	442	12	0	1	0	340	< 2	0.43	4.7				
14	1	4196	12	0	1	0	1120	< 2	0.58	5.7				
15	1	48392	12	0	1	0	> 14760	< 2	0.56	5.7				
16	1	> 48392	12	0	1	0	> 14760	< 2	0.43	4.2				
17	1	39726	12	0	1	0	12460	< 2	0.45	2.8				
18	1	24066	12	0	1	0	> 14760	< 2	0.55	3.6				
19	1	> 48392	12	0	1	0	11100	< 2	0.38	6.5				
20	1	34658	12	0	1	0	7100	< 2	0.56	4.8				
21	1	12262	12	0	1	0	9400	< 2	0.49	6.3				
22	1	4764	12	0	1	0	2920	< 2	0.49	4.5				
23	1	1596	12	0	1	0	1940	< 2	0.45	4.1				
24	1	1182	12	0	1	0	960	< 2	0.41	4.0				
25	1	550	12	0	1	0	1060	< 2	0.41	4.5				
26	1	399	12	0	1	0	560	< 2	0.41	5.6				
27	1	195	12	0	1	0	450	< 2	0.40	6.0				
28	1	122	12	0	1	0	400	< 2	0.41	5.9				
29	1	98	12	0	1	0	480	< 2	0.42	4.9				
30	1	201	12	0	1	0	> 738	< 2	0.40	5.9				
31	1	187	12	0	1	0	507	< 2	0.42	5.2				

Avg.									0.51	3.9				
Max.		48392					12460	< 2	0.64	6.5				
Min.									0.31	1.0				

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Date	Free 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	1.5	1.3	1.8	1.4	1.5	0.3	1.1	1.8		2.6	9
4	1.5	1.3	1.9	1.5	1.5	0.4	1.7	2.1		1.3	9
5	1.0	0.9	1.7	0.9	1.5	0.4	1.0	2.1		1.3	9
6											0
7											0
8											0
9											0
10	1.8	1.2	1.5	1.2	1.4	0.4	1.4	1.9		2.1	9
11	1.4	0.5	1.7	1.3	1.1	0.6	1.5	1.8	1.5	1.1	10
12	1.7	1.0	1.6	1.7	1.6	0.5	1.5	2.0		2.1	9
13											0
14											0
15											0
16											0
17	1.2	1.2	1.6	1.7	1.1	0.6	1.0	2.2	0.7	2.2	10
18	2.0	1.2	2.0	1.9	1.3	0.5	1.7	2.8		0.9	9
19	1.1	1.7	2.2	1.5	0.7	0.5	1.1	0.9		0.9	9
20											0
21											0
22											0
23											0
24	1.9	1.1	2.0	1.9	0.8	0.5	1.7	1.9		2.0	9
25	1.4	1.7	2.1	1.9	1.7	0.6	1.4	1.7		2.0	9
26	1.9	1.4	1.4	1.8	1.3	0.5	1.4	1.9		1.9	9
27											0
28											0
29											0
30											0
31	1.7	0.9	1.6	1.9	1.7	0.7	0.9	1.5		1.0	9

Distribution Sample Summary

Total # of routine distribution samples analyzed	119
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	0
Percent of routine distribution samples positive	0%

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	1.42

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	1.7	1.6	2.2	1.6	1.6	0.4	1.5	2.0		2.8	9
4	1.8	1.6	2.2	1.7	1.8	0.6	2.0	2.3		1.6	9
5	1.7	1.3	2.2	1.2	1.8	0.5	1.7	2.5		1.5	9
6											0
7											0
8											0
9											0
10	2.1	1.5	1.7	1.5	1.6	0.5	1.7	2.2		2.4	9
11	1.7	0.7	2.0	1.6	1.5	0.7	1.7	2.4	1.7	1.4	10
12	2.0	1.2	1.9	2.0	1.9	0.6	1.7	2.3		2.3	9
13											0
14											0
15											0
16											0
17	1.7	1.5	2.0	1.9	1.4	0.7	1.5	2.7	0.9	2.6	10
18	2.3	1.4	2.3	2.2	1.5	0.6	1.9	3.0		1.1	9
19	1.4	1.9	2.7	1.8	1.0	0.7	1.4	1.5		1.1	9
20											0
21											0
22											0
23											0
24	2.4	1.4	2.3	2.3	1.1	0.7	2.0	2.4		2.5	9
25	1.6	2.3	2.7	2.5	1.9	0.8	1.7	1.9		2.5	9
26	2.4	1.8	1.9	2.1	1.6	0.7	1.8	2.2		2.3	9
27											0
28											0
29											0
30											0
31	2.2	1.2	1.9	2.6	1.9	0.9	1.3	1.8		1.3	9

Distribution Disinfectant Total Residual Summary

Percent samples with a detectable disinfectant residual 100%

Average disinfectant residual this month 1.7

Positive Distribution Samples

[illegible]

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT
 WSSN: 2310

Michael Glasgow
 Operator-in-Charge

February 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>25.3</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>86</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>2.4</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>2.4%</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>8,000</u> lb.	Est. supply:	<u>8</u> days
Primary Coagulant (Ferric Chloride) on hand:	<u>125,000</u> lb.	Est. supply:	<u>3</u> days
Lime (CaO) on hand:	<u>397</u> tons	Est. supply:	<u>31</u> days
Fluoride on Hand:	<u>26,600</u> lb.	Est. supply:	<u>40</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.

[illegible]

Filter turbidity

City of Flint Water Treatment Plant

February 2015

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WSSN: 2310

Date	Turbidity, Units												
	Confluence Point. No.1 (N) North						Confluence Point. No.2 (S) South						Point of Entry
	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	Plant Tap NTU
1	8	0.07	0.09	6	0	0	8	0.06	0.09	6	0	0	0.07
2	7	0.06	0.10	6	0	0	7	0.06	0.07	6	0	0	0.07
3	8	0.07	0.15	6	0	0	8	0.06	0.07	6	0	0	0.08
4	8	0.05	0.08	6	0	0	8	0.05	0.07	6	0	0	0.07
5	8	0.07	0.10	6	0	0	8	0.06	0.07	6	0	0	0.07
6	7	0.06	0.08	6	0	0	7	0.06	0.08	6	0	0	0.07
7	8	0.06	0.07	6	0	0	8	0.06	0.06	6	0	0	0.07
8	8	0.06	0.07	6	0	0	8	0.06	0.07	6	0	0	0.06
9	8	0.07	0.09	6	0	0	8	0.05	0.06	6	0	0	0.09
10	7	0.06	0.07	6	0	0	7	0.05	0.06	6	0	0	0.08
11	8	0.06	0.07	6	0	0	8	0.05	0.07	6	0	0	0.07
12	8	0.06	0.08	6	0	0	8	0.06	0.08	6	0	0	0.06
13	8	0.06	0.09	6	0	0	8	0.09	0.18	6	0	0	0.08
14	8	0.06	0.09	6	0	0	8	0.06	0.10	6	0	0	0.05
15	8	0.06	0.08	6	0	0	8	0.07	0.09	6	0	0	0.07
16	8	0.06	0.08	6	0	0	8	0.05	0.07	6	0	0	0.06
17	8	0.06	0.08	6	0	0	8	0.07	0.09	6	0	0	0.07
18	8	0.07	0.09	6	0	0	8	0.07	0.09	6	0	0	0.07
19	8	0.07	0.09	6	0	0	8	0.06	0.08	6	0	0	0.07
20	8	0.07	0.08	6	0	0	8	0.07	0.10	6	0	0	0.07
21	8	0.08	0.14	6	0	0	8	0.08	0.10	6	0	0	0.08
22	8	0.09	0.12	6	0	0	8	0.10	0.13	6	0	0	0.08
23	8	0.13	0.16	6	0	0	8	0.07	0.10	6	0	0	0.10
24	7	0.19	0.36	6	1	1	7	0.14	0.18	6	0	0	0.17
25	8	0.08	0.10	6	0	0	8	0.10	0.12	6	0	0	0.11
26	8	0.13	0.17	6	0	0	8	0.13	0.18	6	0	0	0.14
27	8	0.19	0.29	6	0	0	8	0.15	0.18	6	0	0	0.15
28	8	0.20	0.27	6	0	0	8	0.13	0.18	6	0	0	0.15
Avg.	8	0.08	0.12	6	0	0	8	0.07	0.10	6	0	0	
Max.	8	0.20	0.36	6	1	1	8	0.15	0.18	6	0	0	0.17
Min.	7	0.05	0.07	6	0	0	7	0.05	0.06	6	0	0	

Fluoridation &
ChlorinationCity of Flint Water Treatment Plant
WSSN: 2310

February 2015

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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	0.3	0.23	0.53		1.6	3.1	4.7	0.3	0.6	2.6	3.0	2.5	2.9
2	0.3	0.22	0.48		1.8	2.9	4.7	0.3	0.5	2.4	2.7	2.2	2.5
3	0.3	0.23	0.51	0.52	1.9	3.0	4.9	0.8	1.2	2.6	2.9	2.4	2.7
4	0.4	0.22	0.53		1.9	3.0	4.9	0.6	0.8	2.8	3.0	2.7	3.0
5	0.3	0.22	0.53		1.9	2.9	4.8	0.5	0.7	2.6	3.0	2.2	2.5
6	0.4	0.22	0.57		2.0	3.0	5.0	0.8	1.0	2.7	3.0	2.3	2.8
7	0.3	0.22	0.58		2.1	2.7	4.8	0.3	0.6	2.6	2.9	2.1	2.4
8	0.4	0.23	0.56		2.1	2.7	4.8	0.6	0.8	2.7	3.0	2.2	2.5
9	0.4	0.22	0.64		1.9	2.8	4.7	0.4	0.6	2.7	3.0	2.3	2.6
10	0.4	0.24	0.63	0.56	2.2	2.9	5.1	0.5	0.7	2.8	3.1	2.1	2.4
11	0.4	0.21	0.55		2.2	2.8	5.0	0.7	0.9	2.6	2.8	1.9	2.4
12	0.4	0.21	0.58		2.2	2.7	4.9	0.6	0.8	2.5	2.8	2.1	2.5
13	0.4	0.23	0.59		2.2	2.4	4.6	0.4	0.6	2.0	2.5	1.7	2.2
14	0.4	0.22	0.55		2.2	2.2	4.4	0.6	0.8	2.3	2.6	1.5	2.1
15	0.4	0.21	0.60		2.1	2.2	4.3	0.4	0.6	2.0	2.4	1.9	2.2
16	0.4	0.23	0.59		2.1	2.2	4.3	0.4	0.6	2.1	2.4	1.8	2.1
17	0.4	0.21	0.61	0.54	2.1	2.3	4.4	0.8	1.0	2.0	2.4	1.3	1.7
18	0.3	0.23	0.58		2.0	2.2	4.2	0.3	0.6	1.9	2.4	1.5	2.0
19	0.3	0.24	0.64		2.2	2.1	4.3	0.6	0.8	2.0	2.4	1.7	2.2
20	0.4	0.23	0.56		2.2	2.1	4.3	0.7	1.0	2.0	2.5	1.5	1.9
21	0.4	0.24	0.61		2.2	2.1	4.3	0.5	0.7	1.7	2.2	1.5	2.0
22	0.4	0.23	0.55		2.2	2.1	4.3	0.4	0.6	2.0	2.3	1.7	1.9
23	0.3	0.24	0.64		2.2	2.2	4.4	0.5	0.6	2.0	2.1	1.5	1.6
24	0.3	0.24	0.56	0.54	2.3	2.6	4.9	0.4	0.6	2.5	3.3	2.1	2.5
25	0.3	0.23	0.62		2.3	2.6	4.9	0.5	0.7	2.5	2.9	2.4	2.7
26	0.3	0.23	0.54		2.3	2.7	5.0	0.5	0.7	2.7	3.1	2.5	3.0
27	0.3	0.24	0.56		2.3	2.5	4.8	0.6	0.8	2.3	2.9	2.1	2.5
28	0.3	0.24	0.56		2.3	2.5	4.8	0.6	0.8	2.3	2.8	1.9	2.5

Avg.	0.35	0.23	0.57	0.54	2.1	2.6	4.7	0.5	0.7	2.4	2.7	2.0	2.4
Max.	0.40	0.24	0.64	0.56	2.3	3.1	5.1	0.8	1.2	2.8	3.3	2.7	3.0
Min.	0.30	0.21	0.48	0.52	1.6	2.1	4.2	0.3	0.5	1.7	2.1	1.3	1.6

Chemical Analyses

City of Flint Water Treatment Plant
WSSN: 2310

February 2015

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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	7.78	7.91	339	198	273	60	66	138	109.0	56.9	17.5	14.1	51	98
2	7.92	7.64	343	203	274	77	69	126	110.6	60.1	15.6	12.6	52	91
3	7.75	8.69	344	176	276	62	68	114	113.8	54.5	13.6	10.2	57	90
4	8.04	7.88	346	176	277	62	69	114	114.6	54.5	14.6	10.2	49	88
5	7.77	7.56	349	183	284	63	65	120	118.6	60.9	12.6	7.3	55	89
6	7.92	7.63	350	180	276	52	74	128	117.8	52.9	13.6	11.7	54	95
7	8.07	7.76	348	185	282	68	66	117	113.8	54.5	15.6	11.7	52	92
8	8.05	7.57	347	181	278	50	69	131	111.4	51.3	16.5	12.6	51	91
9	8.11	7.66	349	183	280	62	69	121	112.2	52.9	16.5	12.2	53	94
10	7.95	7.65	350	168	284	47	66	121	113.0	57.7	16.5	6.8	56	95
11	7.97	7.76	345	173	274	54	71	119	109.0	49.7	17.9	12.6	51	92
12	7.85	7.66	342	169	274	51	68	118	117.8	59.3	12.2	5.3	55	92
13	7.77	7.70	345	170	267	53	78	117	121.0	57.7	11.2	4.9	54	90
14	7.86	7.54	344	173	269	52	75	121	125.0	63.3	7.3	3.9	56	93
15	8.00	7.73	349	176	280	53	69	123	113.0	50.5	16.0	12.2	50	94
16	7.89	7.68	353	169	285	47	68	122	123.4	53.7	10.7	8.7	55	95
17	8.05	7.92	360	172	281	49	79	123	118.6	48.9	15.6	11.7	53	92
18	7.96	7.97	352	218	282	102	70	116	125.9	78.6	8.7	5.3	54	91
19	8.11	7.82	358	208	291	91	67	117	120.2	59.3	14.6	13.1	53	92
20	7.93	7.90	362	207	286	94	76	113	133.1	76.2	7.3	4.4	55	87
21	8.00	8.06	362	214	284	98	78	116	133.9	76.2	6.8	4.4	54	86
22	7.98	8.03	366	227	294	113	72	114	116.2	67.3	18.5	14.1	52	88
23	8.07	8.31	361	225	293	112	68	113	121.8	68.9	14.1	12.6	52	86
24	7.95	7.85	361	227	289	101	72	126	133.9	78.6	5.8	6.8	54	88
25	8.03	8.14	365	244	295	127	70	117	118.6	77.8	16.5	11.7	55	89
26	7.91	7.88	365	235	288	108	77	127	132.3	86.6	8.3	4.9	55	89
27	7.96	7.85	354	241	291	117	63	124	131.5	91.4	6.3	2.9	57	89
28	7.90	7.72	358	228	228	115	130	113	127.5	84.2	9.7	3.9	54	87
Avg.	7.95	7.84	352	197	280	76	73	120	119.9	63.7	12.9	9.0	54	91
Max.	8.11	8.69	366	244	295	127	130	138	133.9	91.4	18.5	14.1	57	98
Min.	7.75	7.54	339	168	228	47	63	113	109.0	48.9	5.8	2.9	49	86

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
WSSN: 2310

February 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	41	12	0	1	0	150	< 2	0.53	4.0				
2	1	117	12	0	1	0	132	< 2	0.55	4.2				
3	1	96	12	0	1	0	146	< 2	0.49	4.3				
4	1	86	12	0	1	0	90	< 2	0.51	4.1				
5	1	105	12	0	1	0	183	< 2	0.51	3.5				
6	1	276	12	0	1	0	128	< 2	0.50	2.4				
7	1	124	12	0	1	0	97	< 2	0.50	3.8				
8	1	120	12	0	1	0	80	< 2	0.48	3.8				
9	1	104	12	0	1	0	90	< 2	0.51	4.2				
10	1	93	12	0	1	0	132	< 2	0.50	4.0				
11	1	115	12	0	1	0	83	< 2	0.47	4.3				
12	1	115	12	0	1	0	93	< 2	0.46	3.8				
13	1	153	12	0	1	0	80	< 2	0.50	4.5				
14	1	154	12	0	1	0	93	< 2	0.48	3.6				
15	1	138	12	0	1	0	83	< 2	0.52	0.5				
16	1	179	12	0	1	0	137	< 2	0.50	0.7				
17	1	365	12	0	1	0	166	< 2	0.50	1.2				
18	1	219	12	0	1	0	177	< 2	0.51	1.7				
19	1	153	12	0	1	0	112	< 2	0.45	2.2				
20	1	192	12	0	1	0	62	< 2	0.56	1.9				
21	1	142	12	0	1	0	116	< 2	0.51	4.1				
22	1	160	12	0	1	0	146	< 2	0.55	2.1				
23	1	129	12	0	1	0	112	< 2	0.58	1.0				
24	1	135	12	0	1	0	100	< 2	0.61	3.4				
25	1	145	12	0	1	0	156	< 2	0.61	2.0				
26	1	115	12	0	1	0	108	< 2	0.61	1.2				
27	1	86	12	0	1	0	74	< 2	0.61	3.3				
28	1	84	12	0	1	0	65	< 2	0.56	3.3				

Avg.									0.52	3.0				
Max.		365					183	0	0.61	4.5				
Min.									0.45	0.5				

Date	Free 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	0.7	1.5	1.5	1.5	1.5	0.2	1.7	1.7	1.3	2.0	10
4											0
5	1.0	1.7	1.7	1.7	1.1	0.2	1.8	2.0	0.7	1.4	10
6											0
7											0
8											0
9											0
10	1.0	1.2	1.5	1.3	1.0	0.2	2.0	1.9	0.7	1.0	10
11	1.0	1.3	1.7	1.7	0.9	0.3	1.7	2.3	0.5	0.9	10
12	0.4	1.4	2.3	1.8	0.7	0.2	1.9	2.2	0.5	1.2	10
13											0
14											0
15											0
16											0
17	1.1	0.7	1.2	1.5	0.7	0.2	1.1	1.3		1.5	9
18	1.2	0.8	1.6	1.2	0.8	0.2	1.8	1.7		1.4	9
19	0.9	0.7	1.3	1.0	0.7	0.2	0.8	1.3		1.0	9
20											0
21											0
22											0
23	1.3	0.8	1.3	1.1	0.6	0.2	0.6	1.5		0.8	9
24	1.5	1.1	1.7	1.2	1.0	0.2	2.5	2.2		2.3	9
25											0
26	1.7	1.4	2.0	1.5	1.1	0.3	1.8	1.8		2.1	9
27											0
28											0

Distribution Sample Summary

Total # of routine distribution samples analyzed	104
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	0
Percent of routine distribution samples positive	0%

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	1.22

WSSN: 2310

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
2											0
3	1.0	1.8	1.8	1.9	1.8	0.3	2.0	1.9	1.7	2.4	10
4											0
5	1.3	2.1	2.0	2.0	1.3	0.4	2.1	2.3	1.0	1.6	10
6											0
7											0
8											0
9											0
10	1.3	1.5	1.9	1.6	1.3	0.4	2.4	2.2	1.0	1.3	10
11	1.2	1.5	1.8	1.9	1.1	0.4	1.9	2.6	0.7	1.2	10
12	0.5	1.6	2.4	2.0	0.9	0.4	2.1	2.4	0.6	1.4	10
13											0
14											0
15											0
16											0
17	1.3	1.0	1.4	1.8	0.9	0.3	1.5	1.8		1.7	9
18	1.5	1.0	1.9	1.5	1.0	0.3	2.1	2.0		1.7	9
19	1.3	1.1	1.6	1.5	1.0	0.3	1.0	1.7		1.3	9
20											0
21											0
22											0
23	1.5	1.0	1.6	1.3	0.8	0.3	0.8	1.8		1.2	9
24	1.7	1.3	1.9	1.4	1.2	0.4	2.8	2.4		2.5	9
25											0
26	1.9	1.6	2.4	1.7	1.4	0.5	2.1	2.0		2.5	9
27											0
28											0

Distribution Disinfectant Total Residual Summary	
Percent samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	1.5

Positive Distribution Samples

[illegible]

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT
 WSSN: 2310

Michael Glasgow
 Operator-in-Charge

January 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

DEQ
 RESOURCE MANAGEMENT DIVISION
 FEB 17 2015
 LANSING DISTRICT

Treatment Rate and Filter Data

Maximum Treatment Rate:	<u>19.3</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>76</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>2.1</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>3.6</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>3.2%</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>12,000</u> lb.	Est. supply:	<u>18</u> days
Primary Coagulant (Ferric Chloride) on hand:	<u>110,000</u> lb.	Est. supply:	<u>10</u> days
Lime (CaO) on hand:	<u>257</u> tons	Est. supply:	<u>22</u> days
Fluoride on Hand:	<u>16,630</u> lb.	Est. supply:	<u>42</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

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>244</u>	<u>242</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.		

WSSN: 2310

[illegible]

Filter turbidity

City of Flint Water Treatment Plant

January 2015

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WSSN: 2310

Date	Turbidity, Units												
	Confluence Point. No.1 (N) North						Confluence Point. No.2 (S) South						Point of Entry
	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	Plant Tap NTU
1	8	0.07	0.08	6	0	0	8	0.06	0.09	6	0	0	0.08
2	7	0.07	0.09	6	0	0	7	0.06	0.07	6	0	0	0.07
3	8	0.06	0.08	6	0	0	8	0.06	0.07	6	0	0	0.08
4	8	0.07	0.09	6	0	0	8	0.07	0.11	6	0	0	0.07
5	8	0.06	0.09	6	0	0	8	0.06	0.09	6	0	0	0.07
6	8	0.08	0.09	6	0	0	8	0.07	0.10	6	0	0	0.07
7	8	0.09	0.15	6	0	0	8	0.07	0.09	6	0	0	0.08
8	8	0.08	0.10	6	0	0	8	0.07	0.11	6	0	0	0.08
9	8	0.06	0.08	6	0	0	8	0.05	0.07	6	0	0	0.07
10	8	0.06	0.08	6	0	0	8	0.07	0.09	6	0	0	0.07
11	8	0.06	0.08	6	0	0	8	0.07	0.09	6	0	0	0.07
12	8	0.07	0.09	6	0	0	8	0.07	0.10	6	0	0	0.09
13	8	0.06	0.12	6	0	0	8	0.05	0.07	6	0	0	0.06
14	8	0.07	0.09	6	0	0	8	0.06	0.09	6	0	0	0.07
15	8	0.06	0.09	6	0	0	8	0.07	0.09	6	0	0	0.07
16	8	0.07	0.09	6	0	0	8	0.07	0.10	6	0	0	0.09
17	8	0.07	0.08	6	0	0	8	0.07	0.10	6	0	0	0.07
18	8	0.08	0.11	6	0	0	8	0.07	0.08	6	0	0	0.07
19	8	0.07	0.09	6	0	0	8	0.07	0.11	6	0	0	0.07
20	8	0.07	0.08	6	0	0	8	0.07	0.10	6	0	0	0.11
21	8	0.08	0.11	6	0	0	8	0.07	0.08	6	0	0	0.09
22	8	0.09	0.11	6	0	0	8	0.08	0.09	6	0	0	0.09
23	7	0.08	0.10	6	0	0	7	0.07	0.09	6	0	0	0.08
24	8	0.07	0.09	6	0	0	8	0.06	0.10	6	0	0	0.07
25	8	0.06	0.07	6	0	0	8	0.07	0.09	6	0	0	0.07
26	8	0.07	0.09	6	0	0	6	0.08	0.10	6	0	0	0.07
27	7	0.08	0.11	6	0	0	7	0.07	0.10	6	0	0	0.08
28	7	0.07	0.09	6	0	0	7	0.07	0.10	6	0	0	0.07
29	7	0.07	0.10	6	0	0	7	0.07	0.08	6	0	0	0.07
30	8	0.07	0.09	6	0	0	8	0.07	0.08	6	0	0	0.08
31	8	0.06	0.10	6	0	0	8	0.06	0.08	6	0	0	0.07
Avg.	8	0.07	0.09	6	0	0	8	0.07	0.09	6	0	0	
Max.	8	0.09	0.15	6	0	0	8	0.08	0.11	6	0	0	0.11
Min.	7	0.06	0.07	6	0	0	6	0.05	0.07	6	0	0	

Fluoridation &
ChlorinationCity of Flint Water Treatment Plant
WSSN: 2310

January 2015

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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	0.4	0.24	0.70		1.3	3.5	4.8	0.6	0.9	2.7	3.0	2.1	2.4
2	0.4	0.21	0.62		1.4	3.5	4.9	0.6	0.8	2.6	3.1	2.2	2.6
3	0.3	0.22	0.55		1.8	2.6	4.4	0.5	0.7	2.7	3.3	2.8	3.2
4	0.4	0.20	0.60		1.8	2.5	4.3	0.8	1.0	2.8	3.0	2.9	3.2
5	0.4	0.19	0.23		1.9	2.5	4.4	0.7	1.0	2.8	3.0	2.7	3.0
6	0.3	0.19	0.49	0.39	1.9	2.7	4.6	0.6	0.9	2.7	3.2	2.5	3.2
7	0.3	0.23	0.61		1.9	2.6	4.5	0.7	0.9	2.7	3.0	2.2	2.7
8	0.3	0.19	0.51		1.9	2.6	4.5	0.6	0.9	2.4	3.1	2.1	2.6
9	0.0	0.19	0.51		2.0	3.2	5.2	0.4	0.7	2.8	3.1	2.3	2.8
10	0.0	0.22	0.44		1.8	3.1	4.9	0.4	0.4	2.4	2.9	1.8	2.3
11	0.0	0.20	0.22		1.8	3.0	4.8	0.8	1.1	2.7	3.1	2.5	2.9
12	0.0	0.21	0.21		1.6	3.2	4.8	0.5	0.8	2.8	3.1	2.4	2.8
13	0.0	0.19	0.19	0.35	1.7	3.1	4.8	0.8	1.2	2.8	3.1	2.2	2.6
14	0.0	0.21	0.21		1.6	3.0	4.6	0.4	0.6	2.8	3.1	2.3	2.8
15	0.0	0.22	0.24		1.6	3.0	4.6	0.5	0.9	2.7	3.1	2.0	2.3
16	0.1	0.20	0.20		1.6	3.0	4.6	0.5	0.9	2.3	3.0	2.0	2.5
17	0.3	0.22	0.23		1.7	3.0	4.7	0.4	0.6	2.5	3.0	1.8	2.3
18	0.4	0.19	0.55		1.8	3.2	5.0	0.5	0.8	2.7	3.0	2.5	2.9
19	0.4	0.20	0.64		1.9	3.2	5.1	0.4	0.6	2.8	3.2	2.2	2.6
20	0.0	0.22	0.45	0.31	2.0	3.0	5.0	0.5	0.9	2.9	3.4	2.1	2.7
21	0.2	0.21	0.31		1.9	2.8	4.7	0.5	0.8	2.6	3.0	2.2	2.5
22	0.4	0.20	0.67		1.9	2.9	4.8	0.4	0.7	2.8	3.2	1.9	2.2
23	0.4	0.22	0.41		2.0	3.1	5.1	0.4	0.8	2.6	3.0	1.5	1.8
24	0.4	0.21	0.67		2.0	3.2	5.2	0.7	0.9	2.8	3.0	2.7	3.0
25	0.4	0.23	0.59		2.1	3.1	5.2	0.5	0.8	2.9	3.4	2.4	2.7
26	0.4	0.21	0.57		2.0	3.0	5.0	0.4	0.7	2.7	3.1	2.4	2.7
27	0.4	0.23	0.54	0.55	2.1	3.1	5.2	0.4	0.6	2.7	3.0	2.2	2.5
28	0.4	0.22	0.59		2.0	2.9	4.9	0.8	1.0	2.4	2.7	1.9	2.3
29	0.4	0.25	0.62		2.0	2.9	4.9	0.7	0.9	2.8	3.2	2.2	2.5
30	0.4	0.22	0.63		2.0	3.0	5.0	0.7	0.8	2.5	2.9	2.0	2.5
31	0.3	0.19	0.52		1.9	3.0	4.9	0.6	0.8	2.8	3.2	2.8	3.2

Avg.	0.26	0.21	0.47	0.40	1.8	3.0	4.8	0.6	0.8	2.7	3.1	2.3	2.7
Max.	0.40	0.25	0.70	0.55	2.1	3.5	5.2	0.8	1.2	2.9	3.4	2.9	3.2
Min.	0.00	0.19	0.19	0.31	1.3	2.5	4.3	0.4	0.4	2.3	2.7	1.5	1.8

Chemical
AnalysesCity of Flint Water Treatment Plant
WSSN: 2310

January 2015

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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	8.23	7.65	323	185	264	65	59	120	108.2	55.3	13.6	11.7	47	85
2	7.84	7.31	324	193	258	76	66	117	121.0	65.7	6.3	4.9	47	87
3	7.77	7.38	323	212	257	98	66	114	120.0	77.0	5.8	4.9	48	87
4	8.15	7.86	325	218	261	96	64	122	105.8	64.9	14.6	13.1	48	88
5	8.31	7.80	318	206	262	94	56	112	103.4	60.9	14.6	13.6	45	78
6	8.09	7.97	320	208	256	95	64	113	121.0	69.7	4.9	8.7	48	85
7	8.04	7.91	313	194	256	97	57	97	101.8	61.7	15.6	10.7	43	82
8	8.19	8.04	313	202	251	87	62	115	121.0	72.9	2.9	3.9	48	83
9	8.08	7.96	311	205	248	93	63	112	115.4	70.5	5.8	6.3	47	84
10	7.98	7.75	316	181	255	73	61	108	114.6	64.1	6.8	3.4	47	88
11	8.01	8.24	321	174	256	63	65	111	100.2	44.9	17.5	14.6	44	80
12	8.09	7.68	318	177	250	57	68	120	101.0	46.5	16.0	14.6	49	81
13	7.94	7.69	320	165	245	46	75	119	105.8	44.1	14.1	13.1	47	87
14	7.80	7.52	321	172	252	58	69	114	115.4	56.9	7.8	6.8	48	88
15	7.96	7.64	323	173	258	48	65	125	105.8	48.9	14.1	13.1	45	91
16	7.94	7.47	324	172	257	44	67	128	117.8	58.5	6.8	6.8	47	88
17	7.82	7.95	320	174	252	54	68	120	119.4	58.5	4.9	5.3	46	89
18	8.02	7.72	322	185	258	69	64	116	104.2	55.3	15.1	11.2	48	83
19	8.03	7.62	321	184	255	59	66	125	102.6	54.5	16.0	11.7	48	86
20	7.89	7.59	321	184	255	67	66	117	116.2	64.9	7.8	4.9	49	91
21	7.86	7.79	324	183	257	72	67	111	105.0	51.3	15.1	13.1	50	83
22	7.59	7.42	325	193	262	81	63	112	116.2	68.9	8.3	4.9	49	84
23	7.70	7.44	344	186	256	78	88	108	112.2	59.3	15.6	9.2	52	87
24	7.91	7.51	327	187	259	72	68	115	101.0	48.1	18.5	16.0	48	85
25	7.93	7.71	326	188	260	75	66	113	100.2	50.5	18.5	14.6	47	85
26	7.95	7.82	328	194	259	71	69	123	105.8	54.5	15.6	13.6	51	88
27	7.77	7.99	332	191	266	68	66	123	111.4	60.1	13.1	9.2	51	89
28	7.99	7.98	334	188	264	76	70	112	107.4	51.3	16.0	14.6	48	85
29	7.80	7.83	334	196	268	76	66	120	106.6	57.7	16.5	12.6	55	86
30	7.84	7.78	331	193	272	78	59	115	113.0	59.3	13.1	10.7	55	90
31	7.96	7.91	335	197	267	69	68	128	108.2	56.1	15.6	13.6	51	92

Avg.	7.95	7.74	324	189	258	73	66	116	109.9	58.5	12.2	10.2	48	86
Max.	8.31	8.24	344	218	272	98	88	128	121.0	77	18.5	16.0	55	92
Min.	7.59	7.31	311	165	245	44	56	97	100.2	44.1	2.9	3.4	43	78

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
WSSN: 2310

January 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	2592	12	0	1	0	800	< 2	0.37	5.6				
2	1	1684	12	0	1	0	600	< 2	0.36	4.5				
3	1	960	12	0	1	0	2400	< 2	0.42	4.0				
4	1	718	12	0	1	0	200	< 2	0.44	3.8				
5	1	1732	12	0	1	0	5980	< 2	0.41	3.0				
6	1	874	12	0	1	0	200	< 2	0.41	4.5				
7	1	2086	12	0	1	0	200	< 2	0.39	4.2				
8	1	960	12	0	1	0	120	< 2	0.39	5.5				
9	1	1146	12	0	1	0	420	< 2	0.40	2.6				
10	1	2994	12	0	1	0	760	38	0.31	2.6				
11	1	978	12	0	1	0	520	10	0.36	2.1				
12	1	1042	12	0	1	0	600	< 2	0.36	1.9				
13	1	862	12	0	1	0	340	< 2	0.37	1.4				
14	1	646	12	0	1	0	200	< 2	0.36	1.9				
15	1	736	12	0	1	0	300	< 2	0.36	3.5				
16	1	2224	12	0	1	0	200	< 2	0.37	1.9				
17	1	320	12	0	1	0	200	< 2	0.36	4.9				
18	1	40	12	0	1	0	200	2	0.38	4.9				
19	1	148	12	0	1	0	120	< 2	0.40	5.2				
20	1	770	12	0	1	0	146	< 2	0.38	4.9				
21	1	148	12	0	1	0	80	< 2	0.37	5.9				
22	1	201	12	0	1	0	190	< 2	0.39	5.8				
23	1	345	12	0	1	0	120	< 2		4.9				
24	1	97	12	0	1	0	150	< 2	0.38	6.4				
25	1	146	12	0	1	0	60	< 2	0.39	4.4				
26	1	181	12	0	1	0	230	< 2	0.40	3.8				
27	1	146	12	0	1	0	120	< 2	0.38	4.9				
28	1	172	12	0	1	0	128	< 2	0.38	4.3				
29	1	261	12	0	1	0	137	< 2	0.49	4.2				
30	1	155	12	0	1	0	93	< 2	0.43	4.0				
31	1	41	12	0	1	0	60	< 2	0.53	4.0				

Avg.									0.39	4.0				
Max.							5980	38	0.53	6.4				
Min.									0.31	1.4				

WSSN: 2310

Date	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l										Number of Samples
	1	2	3	4	5	6	7	8	CS	WS	
1	0.7	0.1	1.3	1.6	0.7	0.2	0.2		1.5	1.4	9
2											0
3											0
4											0
5											0
6	0.6	0.7	1.5	2.0	0.8	0.1	1.4	1.8	1.8	1.8	10
7	0.6	0.7	1.7	1.5	0.7	0.2	1.1	2.0	0.8	1.7	10
8	0.8	0.3	1.0	1.3	0.8	0.1	1.4	1.8	0.8	1.7	10
9											0
10											0
11											0
12											0
13	0.4	1.0	1.7	1.4	0.7	0.2	1.4	1.7	0.4	1.7	10
14	0.2	0.5	1.8	1.6	0.5	0.1	2.1	2.2	0.4	2.0	10
15											0
16											0
17											0
18											0
19											0
20	0.1	1.6	1.7	1.4	0.9	0.3	1.9	2.0	1.3	1.8	10
21											0
22											0
23											0
24											0
25											0
26									1.6	1.8	2
27	0.9	1.3	1.2	1.7	0.7	0.2	1.3	1.8	1.4	0.8	10
28	0.8	0.5	1.4	1.5	0.8	0.2	1.8	1.8	1.5	1.8	10
29	0.9	1.7	1.6	1.7	1.0	0.1	2.0	1.9	0.9	2.0	10
30											0
31											0

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	0
Percent of routine distribution samples positive	0%

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	1.15

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Date	Total Chlorine Residual at Bacteriological Monitoring Stations mg/l										
	1	2	3	4	5	6	7	8	CS	WS	Number of Samples
1	0.8	0.2	1.5	1.8	0.9	0.3	0.3		1.7	1.5	9
2											0
3											0
4											0
5											0
6	0.9	0.9	1.4	2.3	1.0	0.2	1.6	2.1	2.2	2.1	10
7	0.8	0.9	1.9	1.8	1.0	0.2	1.3	2.2	1.0	2.0	10
8	1.0	0.5	1.2	1.5	1.1	0.3	1.6	2.0	1.0	2.0	10
9											0
10											0
11											0
12											0
13	0.7	1.5	2.0	1.7	0.9	0.2	1.7	2.3	0.6	2.1	10
14	0.4	1.8	2.1	1.8	0.8	0.3	2.4	2.5	0.5	2.3	10
15											0
16											0
17											0
18											0
19											0
20	0.3	1.9	2.0	1.6	1.2	0.6	2.2	2.3	1.5	2.2	10
21											0
22											0
23											0
24											0
25											0
26									1.9	2.2	2
27	1.3	1.9	1.7	2.1	0.9	0.4	1.7	2.0	1.8	1.0	10
28	1.2	0.8	1.7	1.8	1.2	0.4	2.1	2.3	1.9	2.2	10
29	1.2	2.0	1.9	1.9	1.3	0.2	2.3	2.3	1.1	2.3	10
30											0
31											0

Distribution Disinfectant Total Residual Summary	
Percent samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	1.4

Positive Distribution Samples

[illegible]

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT
 WSSN: 2310

Michael Glasgow
 Operator-in-Charge

December 2014
 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

DEQ
 RESOURCE MANAGEMENT DIVISION

FEB 04 2015

LANSING DISTRICT

Treatment Rate and Filter Data

Maximum Treatment Rate:	<u>23.8</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>74</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>2.4</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>3.2</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>2.9%</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>20,000</u>	lb.	Est. supply:	<u>30</u>	days
Primary Coagulant (Ferric Chloride) on hand:	<u>54,000</u>	lb.	Est. supply:	<u>18</u>	days
Lime (CaO) on hand:	<u>296</u>	tons	Est. supply:	<u>34</u>	days
Fluoride on Hand:	<u>16,630</u>	lb.	Est. supply:	<u>35</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

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>226</u>	<u>226</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.		

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[illegible]

Filter turbidity

City of Flint Water Treatment Plant

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Date	Turbidity, Units												
	Confluence Point, No.1 (N) North						Confluence Point, No.2 (S) South						Point of Entry
	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	Plant Tap NTU
1	8	0.09	0.11	6	0	0	8	0.09	0.10	6	0	0	0.09
2	8	0.08	0.09	6	0	0	8	0.08	0.09	6	0	0	0.08
3	8	0.08	0.12	6	0	0	8	0.07	0.10	6	0	0	0.07
4	8	0.07	0.10	6	0	0	8	0.07	0.08	6	0	0	0.07
5	8	0.07	0.08	6	0	0	8	0.07	0.09	6	0	0	0.08
6	2	0.10	0.12	2	0	0	2	0.10	0.10	2	0	0	0.08
7	0	n/a	n/a	0	0	0	0	n/a	n/a	0	0	0	0.07
8	0	n/a	n/a	0	0	0	0	n/a	n/a	0	0	0	0.12
9	8	0.09	0.19	6	0	0	8	0.07	0.11	6	0	0	0.08
10	8	0.08	0.14	6	0	0	8	0.06	0.07	6	0	0	0.05
11	8	0.08	0.10	6	0	0	8	0.07	0.10	6	0	0	0.07
12	8	0.09	0.13	6	0	0	8	0.09	0.14	6	0	0	0.07
13	8	0.07	0.10	6	0	0	8	0.07	0.08	6	0	0	0.08
14	8	0.06	0.07	6	0	0	8	0.06	0.07	6	0	0	0.05
15	8	0.06	0.06	6	0	0	8	0.06	0.07	6	0	0	0.06
16	8	0.07	0.08	6	0	0	8	0.06	0.06	6	0	0	0.06
17	8	0.07	0.08	6	0	0	8	0.07	0.08	6	0	0	0.08
18	8	0.07	0.11	6	0	0	8	0.06	0.07	6	0	0	0.07
19	8	0.08	0.13	6	0	0	8	0.06	0.09	6	0	0	0.07
20	8	0.07	0.10	6	0	0	8	0.07	0.09	6	0	0	0.06
21	8	0.06	0.07	6	0	0	8	0.06	0.09	6	0	0	0.07
22	8	0.06	0.07	6	0	0	8	0.07	0.16	6	0	0	0.06
23	8	0.07	0.09	6	0	0	8	0.07	0.12	6	0	0	0.07
24	8	0.06	0.10	6	0	0	8	0.06	0.10	6	0	0	0.06
25	8	0.06	0.09	6	0	0	8	0.06	0.10	6	0	0	0.06
26	8	0.08	0.16	6	0	0	8	0.07	0.15	6	0	0	0.08
27	8	0.08	0.12	6	0	0	8	0.07	0.11	6	0	0	0.07
28	8	0.07	0.11	6	0	0	8	0.05	0.07	6	0	0	0.07
29	8	0.07	0.09	6	0	0	8	0.06	0.07	6	0	0	0.08
30	8	0.06	0.08	6	0	0	8	0.05	0.06	6	0	0	0.06
31	8	0.07	0.09	6	0	0	8	0.06	0.08	6	0	0	0.08
Avg	7	0.07	0.10	5	0	0	7	0.07	0.09	5	0	0	
Max	8	0.10	0.19	6	0	0	8	0.10	0.16	6	0	0	0.12
Min	0	0.06	0.06	0	0	0	0	0.05	0.06	0	0	0	

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	0.5	0.22	0.71		2.0	3.8	5.8	0.5	0.8	3.0	3.5	3.0	3.5
2	0.5	0.21	0.72		2.0	3.6	5.6	0.7	1.0	3.0	3.5	2.7	3.2
3	0.5	0.23	0.72		2.1	3.0	5.1	0.7	1.0	2.7	3.2	2.5	2.9
4	0.5	0.21	0.73	0.64	2.0	3.0	5.0	0.6	0.8	3.0	3.5	2.4	2.8
5	0.4	0.21	0.68		1.9	3.0	4.9	0.6	0.8	2.7	3.2	2.2	2.5
6	0.5	0.22	0.77		1.9	3.0	4.9	0.4	0.6	3.1	3.5	2.1	2.5
7	0.0	0.22	0.70		0.0	0.0	0.0	n/a	n/a	3.0	3.5	2.4	2.8
8	0.0	0.22	0.71		0.0	0.0	0.0	n/a	n/a	2.9	3.2	2.6	2.9
9	0.4	0.24	0.67	0.65	2.0	2.3	4.3	0.6	0.8	2.2	2.9	2.7	3.1
10	0.4	0.22	0.71		1.8	2.7	4.5	0.5	0.8	2.6	2.9	2.4	2.7
11	0.4	0.24	0.69		1.8	2.8	4.6	0.5	0.7	2.5	3.1	2.4	2.8
12	0.4	0.21	0.64		1.8	2.7	4.5	0.6	0.8	2.4	2.9	2.0	2.3
13	0.4	0.21	0.63		2.0	2.6	4.6	0.6	0.8	3.0	3.5	2.6	2.9
14	0.4	0.20	0.64		2.0	2.6	4.6	0.7	1.0	2.9	3.2	2.9	3.1
15	0.4	0.24	0.64		2.0	2.6	4.6	0.7	0.9	2.8	3.0	2.6	2.9
16	0.4	0.24	0.63	0.60	2.0	2.6	4.6	0.7	0.9	2.8	3.0	2.3	2.5
17	0.4	0.22	0.63		2.0	2.6	4.6	0.7	0.9	2.7	3.0	2.4	3.0
18	0.4	0.21	0.59		2.0	2.7	4.7	0.6	0.8	2.6	3.0	2.1	2.4
19	0.4	0.21	0.58		2.1	2.6	4.7	0.7	0.9	3.0	3.3	2.6	3.1
20	0.4	0.20	0.61		1.9	2.6	4.5	0.6	0.8	2.6	3.1	2.0	2.5
21	0.4	0.22	0.62		1.3	2.4	3.7	0.6	0.8	2.8	3.0	2.6	2.8
22	0.4	0.22	0.63		2.0	2.6	4.6	0.9	1.1	2.7	3.1	2.6	3.0
23	0.4	0.23	0.63	0.64	1.9	3.1	5.0	0.6	0.9	2.9	3.2	2.5	2.9
24	0.4	0.20	0.63		1.9	3.0	4.9	0.9	1.1	2.8	3.0	2.3	2.7
25	0.4	0.21	0.63		1.9	3.1	5.0	0.5	0.7	2.6	3.0	1.7	2.2
26	0.4	0.23	0.69		2.0	2.8	4.8	0.6	0.7	2.8	3.1	2.3	2.6
27	0.4	0.19	0.60		2.1	2.8	4.9	0.7	0.9	2.9	3.5	1.9	2.5
28	0.4	0.20	0.67		1.9	3.0	4.9	0.6	0.9	2.7	3.0	2.4	2.7
29	0.4	0.21	0.62		1.9	3.0	4.9	0.6	0.9	2.7	3.0	2.7	3.0
30	0.4	0.20	0.60	0.54	1.9	3.1	5.0	0.6	0.9	2.7	2.9	1.9	2.5
31	0.4	0.22	0.63		1.9	3.3	5.2	0.8	1.1	2.7	3.1	2.8	3.1

Avg.	0.39	0.22	0.66	0.61	1.8	2.7	4.5	0.6	0.9	2.8	3.2	2.4	2.8
Max.	0.50	0.24	0.77	0.65	2.1	3.8	5.8	0.9	1.1	3.1	3.5	3.0	3.5
Min.	0.00	0.19	0.58	0.54	0.0	0.0	0.0	0.4	0.6	2.2	2.9	1.7	2.2

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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	8.25	7.82	303	204	248	109	55	95	97.8	63.3	14.6	11.7	47	77
2	8.12	8.27	303	193	248	97	55	96	98.6	54.5	14.1	13.6	47	77
3	8.21	8.25	307	192	243	96	64	96	113.8	64.1	5.8	7.8	47	75
4	8.42	7.84	312	193	257	97	55	96	103.4	55.3	13.6	13.6	48	76
5	8.21	8.23	314	197	257	98	57	99	109.0	65.7	9.7	7.8	45	74
6	8.27	8.34	314	210	254	115	60	95	109.8	69.7	9.7	8.3	47	74
7	8.43	8.08	326	203	265	102	61	101	103.4	58.5	16.5	13.6	47	78
8	8.35	8.00	326	197	268	93	58	104	107.4	56.9	14.1	13.1	48	77
9	8.33	7.95	324	200	263	97	61	103	121.0	71.3	6.3	5.8	48	77
10	8.23	7.95	329	190	269	81	60	109	106.6	53.7	15.1	12.6	48	82
11	8.17	7.95	321	190	261	88	60	102	111.4	68.1	10.2	4.9	48	79
12	8.13	8.33	324	197	260	95	64	102	116.2	70.5	8.3	2.9	49	81
13	8.13	7.41	322	208	261	100	61	108	119.4	75.4	6.3	4.9	48	83
14	8.18	8.16	334	206	270	97	64	109	101.0	55.3	20.4	16.5	48	81
15	8.24	8.18	328	207	269	102	59	105	97.0	59.3	19.9	14.1	50	83
16	8.29	8.37	324	200	269	95	55	105	103.4	55.3	16.0	14.6	48	82
17	8.22	8.18	321	201	261	89	60	112	107.4	65.7	12.2	9.2	44	85
18	8.24	8.15	325	203	264	91	61	112	108.2	60.9	13.6	12.2	48	82
19	7.99	8.03	319	199	258	91	61	108	117.0	69.7	6.8	5.8	48	84
20	8.23	7.90	318	196	252	90	66	106	116.2	70.5	7.3	4.9	48	83
21	8.31	8.20	317	173	260	77	57	96	99.4	51.3	17.0	9.7	45	78
22	8.31	8.35	319	177	266	72	53	105	102.6	48.1	15.1	14.1	47	80
23	8.25	8.22	322	168	263	71	59	97	121.0	52.9	15.1	7.8	49	79
24	8.27	8.49	323	179	264	72	59	107	108.2	54.5	12.6	10.2	46	79
25	8.28	8.12	312	183	255	72	57	111	109.0	63.3	10.2	6.3	49	82
26	8.25	8.18	307	182	248	79	59	103	109.0	65.7	9.7	3.9	46	81
27	8.21	8.07	289	173	232	76	57	97	102.6	64.1	8.3	4.9	44	80
28	8.26	8.03	290	174	235	67	55	107	95.4	52.1	13.1	10.7	42	82
29	8.29	7.62	313	184	251	75	62	109	101.0	53.7	15.1	11.7	43	83
30	8.17	7.77	319	197	257	84	62	113	107.4	60.9	12.2	10.7	46	84
31	8.17	7.67	320	181	260	60	60	121	117.8	69.7	7.3	1.9	48	87

Avg.	8.24	8.07	317	192	258	88	59	104	107.8	61.3	12.1	9.3	47	80
Max.	8.43	8.49	334	210	270	115	66	121	121.0	75.4	20.4	16.5	50	87
Min.	7.99	7.41	289	168	232	60	53	95	95.4	48.1	5.8	1.9	42	74

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
WSSN: 2310

December 2014

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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	24066	12	0	1	0	> 14760	4	0.38	5.1				
2	1	18416	12	0	1	0	2320	2	0.38	6.4				
3	1	6152	12	0	1	0	1360	4	0.37	5.6				
4	1	2324	12	0	1	0	1020	< 2	0.38	5.4				
5	1	852	12	0	1	0	340	< 2	0.38	6.1				
6	1	518	4	0	1	0	40	2	0.40	7.2				
7	1	194	0	0	1	0	80	< 2	0.38	1.4				
8	1	350	0	0	1	0	240	< 2	0.38	3.3				
9	1	342	12	0	1	0	120	< 2	0.40	4.8				
10	1	346	12	0	1	0	240	< 2	0.38	6.5				
11	1	62	12	0	1	0	120	< 2	0.38	4.9				
12	1	40	12	0	1	0	< 2	< 2	0.39	6.0				
13	1	82	12	0	1	0	160	< 2	0.32	6.4				
14	1	40	12	0	1	0	80	2	0.39	5.6				
15	1	20	12	0	1	0	40	< 2	0.40	5.9				
16	1	219	12	0	1	0	> 14760	< 2	0.40	6.0				
17	1	83	12	0	1	0	166	< 2	0.39	6.3				
18	1	88	12	0	1	0	161	< 2	0.40	5.8				
19	1	56	12	0	1	0	116	2	0.39	6.4				
20	1	68	12	0	1	0	156	< 2	0.35	7.0				
21	1	248	12	0	1	0	137	< 2	0.36	3.9				
22	1	308	12	0	1	0	216	< 2	0.36	3.4				
23	1	1300	12	0	1	0	324	< 2	0.35	4.5				
24	1	1300	12	0	1	0	324	< 2	0.36	6.4				
25	1	687	12	0	1	0	470	< 2	0.37	7.4				
26	1	1986	12	0	1	0	392	< 2	0.36	5.1				
27	1	> 2419	12	0	1	0	> 738	< 2	0.37	5.6				
28	1	> 48392	12	0	1	0	9400	2	0.36	4.5				
29	1	39732	12	0	1	0	2640	< 2	0.37	4.0				
30	1	4286	12	0	1	0	560	< 2	0.37	2.2				
31	1	1976	12	0	1	0	300	< 2	0.37	2.6				

Avg.									0.38	5.2				
Max.							9400	4	0.40	7.4				
Min.									0.32	1.4				

WSSN: 2310

Date	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l										
	1	2	3	4	5	6	7	8	CS	WS	Number of Samples
1									2.8	0.7	2
2	0.2	2.0	1.9	1.8	1.2	0.1	1.2	2.1	1.6	1.8	10
3	0.9	1.7	1.9	1.6	1.0	0.1	1.5	1.8	1.8	2.0	10
4	0.6	1.1	1.6	1.7	0.9	0.1	1.4	1.8	1.3	1.7	10
5											0
6											0
7											0
8									0.4	0.4	2
9	0.9	0.1	1.4	0.2	0.1	0.2	1.7	2.5	0.3	1.2	10
10	0.7	0.2	1.8	1.7	0.2	0.2	1.5	1.9	1.6	0.8	10
11	0.6	0.5		1.4	0.8	0.1	1.5	1.8	1.5	0.9	9
12											0
13											0
14											0
15									0.8	1.6	2
16	0.7	1.7	1.5	1.6	0.7	0.2	0.8	1.8	1.3	2.1	10
17	0.6	0.8	1.4	1.5	0.7	0.1	0.8	1.8	1.1	1.4	10
18	0.8	1.5	1.5	1.5	0.5	0.2	1.5	1.8	1.2	1.3	10
19	0.5	1.7	1.7	1.3	0.8	0.1			0.9	1.0	8
20											0
21											0
22											0
23	0.7	1.5	1.3	1.5	0.8	0.3	1.5	1.8	1.8	0.3	10
24	0.6	1.1	2.1	0.6	0.5	0.5	1.0	2.0	0.7	1.2	10
25											0
26											0
27											0
28											0
29											0
30	0.6	0.4	1.7	1.5	0.8	0.3	1.2	2.0		1.4	9
31											0

Distribution Sample Summary

Total # of routine distribution samples analyzed	132
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	0
Percent of routine distribution samples positive	0%

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	1.1

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									3.2	1.0	2
2	0.4	2.6	2.5	2.1	1.5	0.2	1.5	2.5	2.1	2.0	10
3	1.2	2.0	2.1	1.9	1.3	0.4	1.8	2.1	2.1	2.3	10
4	1.0	1.4	1.9	2.0	1.3	0.2	1.7	2.1	1.5	1.9	10
5											0
6											0
7											0
8									0.5	0.6	2
9	1.3	0.2	1.6	0.4	0.3	0.4	1.9	2.7	0.5	1.5	10
10	1.1	0.3	2.1	2.0	0.3	0.3	1.7	2.2	1.9	1.1	10
11	1.0	0.5	1.5	2.0	0.8	0.3	2.1	1.9	2.0	2.0	10
12	0.9	0.8		1.6	1.0	0.3	1.7	2.0	1.8	1.2	9
13											0
14											0
15									1.1	1.9	2
16	0.9	2.1	1.8	1.8	1.0	0.3	1.0	2.3	1.5	2.4	10
17	0.8	1.1	1.7	1.8	1.0	0.3	1.0	2.1	1.4	1.8	10
18	1.0	1.7	1.7	1.8	0.8	0.2	1.7	2.0	1.4	1.6	10
19	0.8	1.9	1.9	1.5	1.1	0.3			1.2	1.3	8
20											0
21											0
22											0
23	1.0	1.7	1.6	1.7	1.1	0.5	1.7	2.1	2.0	0.6	10
24	0.8	1.2	2.3	0.8	0.7	0.8	1.2	2.3	0.9	1.4	10
25											0
26											0
27											0
28											0
29											0
30	0.8	0.5	1.9	1.7	1.1	0.5	1.4	2.4		1.6	9
31											0

Distribution Disinfectant Total Residual Summary

Percent samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	1.4

Positive Distribution Samples

[illegible]

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT
 WSSN: 2310

Michael Glasgow
 Operator-in-Charge

November 2014
 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

DEQ
 RESOURCE MANAGEMENT DIVISION

Treatment Rate and Filter Data

Maximum Treatment Rate:	<u>18.7</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>76</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>2.1</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>3.2</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>3.2%</u>	Percent of Treated Water

DEC 15 2014

LANSING DISTRICT

Chemical Data

Chlorine on hand:	<u>12,000</u> lb.	Est. supply:	<u>15</u> days
Primary Coagulant (Ferric Chloride) on hand:	<u>194,500</u> lb.	Est. supply:	<u>22</u> days
Lime (CaO) on hand:	<u>393</u> tons	Est. supply:	<u>38</u> days
Fluoride on Hand:	<u>15,000</u> lb.	Est. supply:	<u>40</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>227</u>	<u>227</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? 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.

UNRECORDED

Filter turbidity

City of Flint Water Treatment Plant

November 2014 Page 3

WSSN: 2310

Date	Turbidity, Units												
	Confluence Point No.1 (N) North						Confluence Point No.2 (S) South						Point of Entry
	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	Plant Tap NTU
1	8	0.09	0.14	6	0	0	8	0.10	0.12	6	0	0	0.11
2	8	0.10	0.13	6	0	0	8	0.09	0.11	6	0	0	0.10
3	8	0.10	0.13	6	0	0	8	0.10	0.13	6	0	0	0.11
4	8	0.10	0.11	6	0	0	8	0.11	0.13	6	0	0	0.12
5	8	0.08	0.11	6	0	0	8	0.08	0.09	6	0	0	0.09
6	8	0.09	0.11	6	0	0	8	0.09	0.11	6	0	0	0.11
7	8	0.10	0.12	6	0	0	8	0.10	0.12	6	0	0	0.12
8	8	0.10	0.17	6	0	0	8	0.09	0.12	6	0	0	0.11
9	8	0.11	0.13	6	0	0	8	0.10	0.13	6	0	0	0.11
10	8	0.11	0.15	6	0	0	8	0.10	0.15	6	0	0	0.12
11	8	0.10	0.18	6	0	0	8	0.09	0.14	6	0	0	0.11
12	8	0.10	0.14	6	0	0	8	0.08	0.10	6	0	0	0.10
13	8	0.08	0.09	6	0	0	8	0.07	0.09	6	0	0	0.09
14	8	0.07	0.09	6	0	0	8	0.07	0.09	6	0	0	0.09
15	8	0.07	0.08	6	0	0	8	0.07	0.09	6	0	0	0.08
16	8	0.07	0.09	6	0	0	8	0.08	0.13	6	0	0	0.08
17	5	0.07	0.09	5	0	0	5	0.07	0.09	5	0	0	0.07
18	2	0.10	0.12	2	0	0	2	0.08	0.10	2	0	0	0.07
19	8	0.08	0.10	6	0	0	8	0.07	0.09	6	0	0	0.07
20	8	0.08	0.10	6	0	0	8	0.06	0.07	6	0	0	0.07
21	8	0.08	0.09	6	0	0	8	0.07	0.09	6	0	0	0.08
22	8	0.08	0.12	6	0	0	8	0.07	0.09	6	0	0	0.07
23	8	0.08	0.08	6	0	0	8	0.08	0.09	6	0	0	0.07
24	8	0.08	0.12	6	0	0	8	0.08	0.09	6	0	0	0.08
25	8	0.09	0.12	6	0	0	8	0.08	0.10	6	0	0	0.07
26	8	0.09	0.10	6	0	0	8	0.08	0.10	6	0	0	0.07
27	4	0.08	0.09	4	0	0	4	0.07	0.09	4	0	0	0.07
28	8	0.08	0.09	6	0	0	8	0.08	0.11	6	0	0	0.06
29	8	0.08	0.08	6	0	0	8	0.08	0.15	6	0	0	0.06
30	8	0.09	0.11	6	0	0	8	0.09	0.11	6	0	0	0.08
Avg.	8	0.09	0.11	6	0	0	8	0.08	0.11	6	0	0	
Max.	8	0.11	0.18	6	0	0	8	0.11	0.15	6	0	0	0.12
Min.	2	0.07	0.08	2	0	0	2	0.06	0.07	2	0	0	

Fluoridation &
ChlorinationCity of Flint Water Treatment Plant
WSSN: 2310

November 2014

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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	0.50	0.18	0.64		2.4	3.6	6.0	0.8	1.1	3.2	3.5	2.4	2.9
2	0.50	0.21	0.73		2.2	3.3	5.4	0.9	1.3	3.2	3.5	3.0	3.5
3	0.50	0.21	0.76		2.4	3.5	5.9	0.9	1.3	3.2	3.5	3.2	3.5
4	0.45	0.22	0.72	0.69	2.5	3.5	6.0	0.8	1.1	3.2	3.5	2.9	3.3
5	0.45	0.22	0.70		2.4	3.2	5.6	0.9	1.1	3.2	3.5	2.1	2.5
6	0.45	0.22	0.72		2.3	3.6	5.9	0.7	1.0	3.2	3.5	2.4	2.8
7	0.45	0.22	0.75		2.4	4.1	6.5	0.8	1.1	2.5	3.1	1.8	2.4
8	0.40	0.23	0.69		2.3	3.9	6.2	0.9	1.1	3.0	3.5	2.5	2.9
9	0.40	0.23	0.67		2.2	3.8	6.0	0.8	1.0	3.0	3.5	3.0	3.5
10	0.40	0.22	0.63		2.2	4.1	6.3	0.7	1.0	3.0	3.5	3.0	3.5
11	0.45	0.26	0.71	0.68	1.6	4.2	5.8	0.8	1.1	3.0	3.5	3.0	3.5
12	0.40	0.21	0.63		1.7	3.6	5.3	0.8	1.0	2.6	3.0	2.1	2.5
13	0.35	0.21	0.55		2.1	3.6	5.7	0.8	1.1	3.0	3.5	2.9	3.2
14	0.40	0.22	0.58		2.0	3.7	5.7	0.8	1.1	3.2	3.5	2.3	3.0
15	0.40	0.23	0.61		1.8	3.7	5.5	0.7	0.9	3.0	3.5	2.5	3.0
16	0.35	0.21	0.54		1.8	3.7	5.5	0.5	0.8	3.2	3.5	2.7	3.0
17	0.35	0.22	0.63		1.6	3.5	5.1	0.5	0.8	3.2	3.5	2.9	3.2
18	0.35	0.22	0.61	0.59	1.9	2.9	4.8	0.2	0.3	3.0	3.2	2.8	3.3
19	0.30	0.22	0.46		1.9	2.9	4.8	0.5	0.8	2.5	3.0	2.2	2.8
20	0.40	0.22	0.60		1.9	3.0	4.9	0.5	0.7	3.0	3.4	2.1	2.4
21	0.45	0.21	0.66		1.8	2.9	4.7	0.6	0.9	2.7	3.1	2.2	2.6
22	0.40	0.20	0.61		2.0	3.0	5.0	0.5	0.8	2.5	3.0	2.0	2.5
23	0.35	0.21	0.59		2.1	2.8	4.9	0.6	0.9	3.0	3.5	2.7	3.2
24	0.40	0.21	0.62		2.0	2.7	4.7	0.8	1.1	2.8	3.2	2.7	3.2
25	0.40	0.23	0.64		2.2	2.8	5.0	0.7	1.0	2.6	3.1	2.4	3.0
26	0.40	0.22	0.63		2.0	2.7	4.7	0.7	1.0	2.9	3.4	2.5	2.9
27	0.40	0.22	0.63		1.5	2.6	4.1	0.7	1.0	3.0	3.5	2.8	3.2
28	0.40	0.20	0.61		2.0	2.9	4.9	0.7	0.9	2.7	3.3	2.1	2.6
29	0.40	0.21	0.62		2.1	3.3	5.4	0.6	0.8	2.4	3.1	2.2	2.5
30	0.40	0.21	0.69		2.1	3.8	5.9	0.6	0.9	3.0	3.5	3.0	3.5

Avg.	0.41	0.22	0.64	0.65	2.0	3.4	5.4	0.7	1.0	2.9	3.4	2.5	3.0
Max.	0.50	0.26	0.76	0.69	2.5	4.2	6.5	0.9	1.3	3.2	3.5	3.2	3.5
Min.	0.30	0.18	0.46	0.59	1.5	2.6	4.1	0.2	0.3	2.4	3.0	1.8	2.4

Chemical Analyses

City of Flint Water Treatment Plant
WSSN: 2310

November 2014

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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	8.32	7.75	281	168	225	91	56	77	101.8	64.1	6.8	1.0	45	67
2	8.43	8.17	286	163	238	81	48	82	89.8	47.3	15.1	10.7	44	67
3	8.41	8.11	285	175	230	84	55	91	93.0	49.7	12.6	11.7	45	70
4	8.39	7.29	285	172	233	78	52	94	93.0	54.5	13.1	9.2	46	70
5	8.41	7.61	290	162	240	81	50	81	90.6	51.3	15.6	8.7	49	72
6	8.40	7.72	288	160	235	81	53	79	89.0	46.5	15.6	9.2	46	69
7	8.41	7.71	289	167	236	82	53	85	102.6	59.9	8.3	4.9	45	68
8	8.41	7.77	291	164	232	78	59	86	102.6	60.1	8.3	3.4	47	69
9	8.46	7.80	297	160	236	78	61	82	86.6	42.5	19.4	13.1	48	71
10	8.44	7.82	294	166	241	83	53	83	93.0	43.3	14.6	14.1	47	70
11	8.52	8.09	296	168	237	84	59	84	107.4	60.1	7.3	3.4	48	70
12	8.50	7.81	297	167	244	81	53	86	96.2	50.5	13.1	9.2	45	71
13	8.51	7.39	300	163	241	78	59	85	112.2	59.3	4.9	4.4	48	70
14	8.53	7.59	301	148	241	60	60	88	115.4	59.3	3.4	1.5	46	69
15	8.54	7.77	302	146	235	64	67	82	109.0	52.1	7.8	4.9	47	68
16	8.54	8.13	301	149	247	64	54	85	100.2	41.7	11.7	10.2	49	72
17	8.57	7.57	313	152	249	64	64	88	101.8	40.9	13.6	11.2	47	71
18	8.48	7.53	307	152	254	70	53	82	95.4	44.9	17.5	8.7	47	72
19	8.51	7.59	308	183	248	90	60	93	104.2	65.7	11.7	3.9	47	68
20	8.42	7.50	313	187	248	95	65	92	104.2	64.9	12.2	5.8	47	73
21	8.31	8.14	310	191	251	100	59	91	113.8	70.5	6.8	2.9	47	72
22	8.31	7.92	308	202	249	113	59	89	103.4	68.9	12.2	6.8	48	74
23	8.38	7.97	321	213	252	122	69	91	101.0	64.1	17.0	12.6	48	76
24	8.36	8.34	312	211	246	121	66	90	85.0	56.1	23.8	18.0	50	75
25	8.25	7.85	311	209	250	111	61	98	105.0	70.1	11.2	6.8	50	75
26	8.22	8.29	311	196	251	108	60	88	107.4	71.3	10.2	4.4	47	72
27	8.40	8.24	310	189	255	100	55	89	99.4	54.5	14.6	12.6	48	72
28	8.32	8.23	304	179	248	100	56	79	116.2	64.9	3.9	1.0	48	69
29	8.16	8.45	302	192	245	102	57	90	109.8	64.1	7.3	7.3	47	72
30	8.20	8.04	309	197	149	102	160	95	102.6	61.7	12.6	10.2	46	77

Avg.	8.40	7.87	301	175	240	88	61	87	101.1	56.8	11.7	7.7	47	71
Max.	8.57	8.45	321	213	255	122	160	98	116.2	71.3	23.8	18.0	50	77
Min.	8.16	7.29	281	146	149	60	48	77	85.0	40.9	3.4	1.0	44	67

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
WSSN: 2310

November 2014

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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	564	12	0	1	0	860	< 2	0.39	10.8				
2	1	654	12	0	1	0	1060	< 2	0.38	8.8				
3	1	296	12	0	1	0	190	< 2	0.39	8.9				
4	1	218	12	0	1	0	160	< 2	0.36	9.6				
5	1	486	12	0	1	0	3780	< 2	0.36	9.0				
6	1	194	12	0	1	0	3660	< 2	0.36	9.8				
7	1	268	12	0	1	0	1770	< 2	0.40	10.2				
8	1	194	12	0	1	0	4180	< 2	0.37	9.3				
9	1	296	12	0	1	0	3420	< 2	0.39	8.1				
10	1	172	12	0	1	0	4460	2	0.40	8.8				
11	1	296	12	0	1	0	1720	< 2	0.40	8.3				
12	1	218	12	0	1	0	1600	< 2	0.37	7.7				
13	1	40	12	0	1	0	1420	< 2	0.39	7.0				
14	1	126	12	0	1	0	800	< 2	0.37	6.4				
15	1	104	12	0	1	0	420	< 2	0.37	6.3				
16	1	82	12	0	1	0	560	< 2	0.36	5.5				
17	1	104	10	0	1	0	340	< 2	0.37	4.7				
18	1	104	4	0	1	0	160	< 2	0.33	4.0				
19	1	40	12	0	1	0	40	< 2	0.40	4.9				
20	1	40	12	0	1	0	520	< 2	0.41	5.3				
21	1	20	12	0	1	0	80	2	0.42	5.4				
22	1	82	12	0	1	0	80	< 2	0.44	5.9				
23	1	168	12	0	1	0	340	2	0.46	5.8				
24	1	768	12	0	1	0	660	< 2	0.46	6.4				
25	1	596	12	0	1	0	420	< 2	0.46	6.2				
26	1	1008	12	0	1	0	340	< 2	0.43	5.6				
27	1	1240	8	0	1	0	460	2	0.36	5.1				
28	1	7308	12	0	1	0	2240	< 2	0.37	5.4				
29	1	9768	12	0	1	0	3120	< 2	0.38	6.3				
30	1	19608	12	0	1	0	5140	< 2	0.37	6.5				

Avg.									0.39	7.1				
Max							5140	2	0.46	10.8				
Min.									0.33	4.0				

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Date	Free 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
4	0.4	1.6	1.2	1.5	0.8	0.1	0.3	1.9	0.8	1.8	10
5											0
6	0.3	1.2	1.1	1.6	1.0	0.1	0.2	1.5	1.5	1.0	10
7											0
8											0
9											0
10											0
11	0.5	1.4	1.7	1.8	0.9	0.1	0.5	1.8	1.2	2.0	10
12	0.1	1.0	1.1	1.6	0.5	0.1	0.1	2.7	0.8	0.7	10
13	0.5	1.1	1.5	1.8	0.3	0.1	0.5	2.2	1.7	0.5	10
14									0.6	1.8	2
15											0
16											0
17										1.3	1
18	0.1	0.3	1.7	0.4	0.4	0.1	0.2	1.7	0.3	0.7	10
19	0.5	0.3	1.3	1.8	0.5	0.1	1.0	1.8	3.5	1.5	10
20	0.7	1.3	1.4	1.9	0.5	0.1	0.7	1.7	1.7	1.8	10
21											0
22											0
23											0
24									1.1	0.5	2
25	0.5	1.6	1.6	0.9	0.3	0.1	1.5	1.5	0.9	1.6	10
26	0.6	0.7	1.9	1.7	1.0	0.2	0.6	1.7	1.8	1.7	10
27											0
28	0.1	0.8	1.5	1.4	0.6	0.6	1.5	1.7	0.7	1.4	10
29											0
30											0

Distribution Sample Summary

Total # of routine distribution samples analyzed	115
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	0
Percent of routine distribution samples positive	0%

Distribution Disinfectant Total Residual Summary

Percentage of samples with a detectable disinfectant residual	97%
Average disinfectant residual this month	1.0

See page 9 for positive sample information.

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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
4	0.7	1.8	1.4	1.7	1.0	1.5	0.5	2.3	1.2	2.1	10
5											0
6	0.5	1.5	1.5	1.9	1.3	0.2	0.3	2.0	1.8	1.4	10
7											0
8											0
9											0
10											0
11	0.9	1.7	2.2	2.1	1.3	0.2	0.8	2.2	1.5	2.3	10
12	0.3	1.3	1.4	1.9	0.8	0.2	0.3	3.2	1.1	1.0	10
13	0.8	1.5	1.8	2.0	0.5	0.2	0.9	2.5	2.0	0.8	10
14									0.8	2.1	2
15											0
16											0
17										1.6	1
18	0.2	0.5	2.0	0.6	0.6	0.2	0.3	2.2	0.5	1.0	10
19	0.8	0.5	1.7	2.3	0.8	0.4	1.4	2.2	3.5	1.8	10
20	1.0	1.6	1.7	2.2	0.8	0.2	1.1	2.1	1.9	2.4	10
21											0
22											0
23											0
24									1.4	0.8	2
25	0.8	1.9	2.0	1.3	0.6	0.3	1.8	1.8	1.3	2.0	10
26	1.1	1.0	1.7	2.1	1.3	0.3	0.9	2.1	2.1	2.0	10
27											0
28	0.2	1.2	1.8	1.7	0.9	0.9	1.8	2.1	1.1	1.7	10
29											0
30											0

Distribution Disinfectant Total Residual Summary

Percent samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	1.3

Positive Distribution Samples

[illegible]

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT

WSSN: 2310

Michael Glasgow

Operator-in-Charge

October 2014

Month/Year

F-1R, F-2

Certification of Operator-in-Charge

F-1

Water Plant Classification

Signature of Operator-in-Charge

Genesee

County

DEQ
RESOURCE MANAGEMENT DIVISION

NOV 17 2014

LANSING DISTRICT

Treatment Rate and Filter Data

Maximum Treatment Rate:	<u>23.3</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>84</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>1.9</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>2.7%</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>20,000</u> lb.	Est. supply:	<u>25</u> days
Primary Coagulant (Ferric Chloride) on hand:	<u>133,600</u> lb.	Est. supply:	<u>16</u> days
Lime (CaO) on hand:	<u>239</u> tons	Est. supply:	<u>24</u> days
Fluoride on Hand:	<u>10,000</u> lb.	Est. supply:	<u>27</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>246</u>	<u>246</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.	

COMPLETED

P. K. Kauter

[illegible]

Filter turbidity

City of Flint Water Treatment Plant

October 2014

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Date	Turbidity, Units												
	Confluence Point. No.1 (N) North						Confluence Point. No.2 (S) South						Point of Entry
	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	Plant Tap NTU
1	8	0.11	0.14	6	0	0	8	0.08	0.12	6	0	0	0.09
2	8	0.09	0.12	6	0	0	8	0.08	0.11	6	0	0	0.08
3	7	0.08	0.09	6	0	0	7	0.07	0.09	6	0	0	0.07
4	8	0.09	0.10	6	0	0	8	0.09	0.12	6	0	0	0.08
5	8	0.10	0.12	6	0	0	8	0.09	0.11	6	0	0	0.09
6	8	0.10	0.14	6	0	0	8	0.10	0.13	6	0	0	0.09
7	8	0.08	0.08	6	0	0	8	0.08	0.11	6	0	0	0.08
8	8	0.09	0.11	6	0	0	8	0.08	0.10	6	0	0	0.09
9	8	0.09	0.12	6	0	0	8	0.10	0.13	6	0	0	0.10
10	8	0.09	0.12	6	0	0	8	0.08	0.10	6	0	0	0.09
11	8	0.09	0.13	6	0	0	8	0.09	0.12	6	0	0	0.10
12	8	0.09	0.12	6	0	0	8	0.09	0.14	6	0	0	0.09
13	8	0.09	0.12	6	0	0	8	0.07	0.08	6	0	0	0.07
14	8	0.09	0.11	6	0	0	8	0.09	0.10	6	0	0	0.08
15	8	0.08	0.09	6	0	0	8	0.07	0.09	6	0	0	0.08
16	7	0.10	0.12	6	0	0	7	0.09	0.11	6	0	0	0.09
17	8	0.08	0.09	6	0	0	8	0.08	0.09	6	0	0	0.08
18	8	0.08	0.09	6	0	0	8	0.07	0.08	6	0	0	0.08
19	8	0.07	0.09	6	0	0	8	0.07	0.08	6	0	0	0.07
20	8	0.08	0.11	6	0	0	8	0.09	0.15	6	0	0	0.08
21	8	0.08	0.10	6	0	0	8	0.08	0.10	6	0	0	0.09
22	8	0.08	0.10	6	0	0	8	0.09	0.10	6	0	0	0.09
23	8	0.08	0.14	6	0	0	8	0.07	0.08	6	0	0	0.09
24	8	0.07	0.09	6	0	0	8	0.07	0.10	6	0	0	0.09
25	8	0.07	0.10	6	0	0	8	0.07	0.09	6	0	0	0.11
26	8	0.07	0.12	6	0	0	8	0.07	0.09	6	0	0	0.08
27	8	0.07	0.11	6	0	0	8	0.06	0.08	6	0	0	0.09
28	8	0.08	0.11	6	0	0	8	0.08	0.10	6	0	0	0.08
29	8	0.09	0.10	6	0	0	8	0.09	0.10	6	0	0	0.11
30	8	0.11	0.14	6	0	0	8	0.10	0.13	6	0	0	0.11
31	8	0.10	0.14	6	0	0	8	0.09	0.11	6	0	0	0.12
Avg.	8	0.09	0.11	6	0	0	8	0.08	0.10	6	0	0	
Max.	8	0.11	0.14	6	0	0	8	0.10	0.15	6	0	0	0.12
Min.	7	0.07	0.08	6	0	0	7	0.06	0.08	6	0	0	

Fluoridation &
ChlorinationCity of Flint Water Treatment Plant
WSSN: 2310

October 2014

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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	0.5	0.20	0.68		2.6	4.0	6.6	0.7	1.1	3.2	3.5	2.5	3.2
2	0.5	0.21	0.70		2.7	4.0	6.7	0.7	0.9	3.0	3.5	2.5	3.1
3	0.5	0.21	0.72		2.9	4.1	7.0	0.5	0.7	2.7	3.5	2.5	3.1
4	0.4	0.22	0.72		2.7	3.9	6.6	0.7	1.1	3.2	3.5	2.4	2.9
5	0.4	0.20	0.67		2.9	4.2	7.1	1.1	1.4	3.2	3.7	1.9	2.4
6	0.5	0.21	0.70		2.6	3.9	6.5	0.6	0.9	3.2	3.5	2.3	2.8
7	0.5	0.20	0.71	0.62	2.6	3.9	6.5	0.6	0.8	3.2	3.5	2.4	2.7
8	0.4	0.23	0.69		2.6	4.0	6.6	0.8	1.0	3.2	3.5	2.5	3.1
9	0.4	0.19	0.66		2.5	3.9	6.4	0.7	1.0	3.2	3.5	2.5	3.0
10	0.4	0.20	0.62		2.4	3.8	6.2	0.7	0.9	3.0	3.5	2.4	3.1
11	0.4	0.21	0.63		2.3	3.9	6.2	0.7	0.9	3.0	3.5	2.7	3.1
12	0.4	0.21	0.66		2.3	3.8	6.1	0.6	0.8	2.8	3.5	1.9	2.5
13	0.4	0.20	0.63		2.4	4.1	6.5	0.8	1.1	3.2	3.5	3.2	3.5
14	0.4	0.22	0.68		2.5	4.0	6.5	0.6	0.9	2.9	3.5	2.8	3.2
15	0.4	0.21	0.64		2.5	3.9	6.4	0.7	1.1	3.2	3.5	2.8	3.5
16	0.4	0.21	0.74		2.5	4.0	6.5	0.7	1.0	3.0	3.5	3.0	3.5
17	0.4	0.20	0.70	0.68	2.6	4.0	6.6	0.5	0.8	3.1	3.5	3.2	3.5
18	0.5	0.21	0.62		2.7	3.3	6.0	0.6	1.1	3.0	3.5	3.2	3.5
19	0.4	0.21	0.63		2.6	3.4	6.0	0.9	1.2	3.0	3.5	3.0	3.5
20	0.4	0.21	0.59		2.4	3.7	6.1	0.6	0.9	3.0	3.5	3.0	3.5
21	0.4	0.20	0.66	0.62	2.4	3.7	6.1	0.5	0.9	3.0	3.5	2.7	3.1
22	0.4	0.22	0.65		2.4	3.8	6.2	0.5	0.8	2.6	3.5	2.1	2.6
23	0.4	0.20	0.64		2.5	3.6	6.1	0.7	0.9	3.0	3.5	2.8	3.0
24	0.4	0.22	0.67		2.4	3.5	5.9	0.7	1.0	2.9	3.5	2.2	2.7
25	0.5	0.21	0.68		2.3	3.6	5.9	0.6	0.9	2.8	3.5	2.2	2.7
26	0.4	0.20	0.66		2.2	3.7	5.9	0.8	1.0	3.0	3.5	3.0	3.5
27	0.4	0.20	0.64		2.1	4.5	6.6	0.7	1.0	3.0	3.5	2.9	3.3
28	0.4	0.21	0.67	0.65	2.1	3.9	6.0	0.5	0.8	2.7	3.5	2.7	3.2
29	0.5	0.21	0.67		2.3	4.1	6.4	0.6	0.8	3.0	3.5	2.3	2.8
30	0.5	0.20	0.66		2.2	3.4	5.6	0.6	1.1	3.0	3.5	3.0	3.5
31	0.5	0.18	0.71		2.2	3.4	5.6	0.6	0.8	2.9	3.5	2.1	2.6

Avg.	0.43	0.21	0.67	0.64	2.5	3.8	6.3	0.7	1.0	3.0	3.5	2.6	3.1
Max.	0.50	0.23	0.74	0.68	2.9	4.5	7.1	1.1	1.4	3.2	3.7	3.2	3.5
Min.	0.40	0.18	0.59	0.62	2.1	3.3	5.6	0.5	0.7	2.6	3.5	1.9	2.4

Chemical Analyses

City of Flint Water Treatment Plant

October 2014

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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	8.00	7.81	254	144	219	72	35	72	81.8	45.7	12.6	7.8	41	65
2	8.19	7.85	249	147	209	68	40	79	81.8	49.7	10.2	5.8	42	62
3	8.17	7.91	254	157	206	74	48	83	85.8	54.5	10.7	4.3	44	62
4	8.13	7.43	249	160	205	83	44	77	84.2	55.2	10.7	5.8	43	61
5	8.28	7.83	253	157	210	82	43	75	77.0	51.3	15.1	6.8	43	61
6	8.26	7.89	255	152	208	74	47	78	79.4	49.7	13.6	6.3	42	62
7	8.28	7.45	259	162	210	87	49	75	77.8	48.1	15.6	9.7	41	64
8	8.26	7.65	253	162	202	76	51	86	87.4	57.7	8.2	4.9	42	64
9	8.27	7.90	252	157	209	77	43	80	79.4	47.3	13.1	8.7	42	64
10	8.26	7.60	256	166	205	84	51	82	85.8	54.5	9.7	6.3	42	65
11	8.31	7.45	254	175	203	86	51	89	86.0	63.3	7.8	4.3	43	64
12	8.25	7.69	255	156	204	71	51	85	81.0	51.3	13.1	7.3	44	65
13	8.38	7.79	256	152	210	76	46	76	72.9	48.1	17.5	6.8	45	66
14	8.34	7.53	255	155	203	73	52	82	89.0	56.9	8.3	2.9	45	65
15	7.97	7.88	249	148	206	70	43	78	71.3	48.9	18.0	5.3	43	67
16	8.32	7.90	256	156	212	80	44	76	84.2	47.3	11.2	9.2	45	68
17	8.36	7.68	260	160	210	83	50	77	69.7	45.7	21.4	10.7	43	67
18	8.24	7.96	252	167	210	79	42	88	81.8	53.7	11.7	5.8	42	70
19	8.31	8.11	262	174	211	82	51	92	83.4	54.5	13.1	8.7	42	71
20	8.21	7.60	264	182	212	93	52	89	81.0	60.1	14.6	7.8	43	72
21	8.26	7.59	262	197	215	107	47	90	83.4	60.9	12.6	10.2	43	72
22	8.26	7.63	266	186	216	90	50	96	86.6	63.3	11.7	6.8	44	69
23	8.24	7.43	267	180	222	91	45	89	84.2	58.5	14.6	8.7	42	70
24	8.19	7.82	271	162	220	71	51	91	83.4	55.3	15.6	5.8	45	69
25	8.21	7.88	273	160	221	74	52	86	85.8	56.9	14.1	3.4	43	70
26	8.04	7.76	270	161	224	70	46	91	82.6	52.1	16.0	7.3	43	70
27	8.25	7.61	278	157	233	72	45	85	87.4	49.7	14.6	9.2	42	70
28	8.33	7.41	278	164	237	76	41	88	84.2	56.1	17.1	5.3	44	62
29	8.28	7.48	276	160	230	85	46	75	86.6	46.5	16.0	10.2	43	64
30	8.40	7.88	278	158	225	75	53	83	86.6	52.9	15.1	4.4	44	62
31	8.37	7.75	280	172	223	92	57	80	87.4	53.7	15.1	8.7	47	65

Avg.	8.25	7.71	261	163	214	80	47	83	82.5	53.2	13.5	6.9	43	66
Max.	8.40	8.11	280	197	237	107	57	96	89.0	63.3	21.4	10.7	47	72
Min.	7.97	7.41	249	144	202	68	35	72	69.7	45.7	7.8	2.9	41	61

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
WSSN: 2310

#####

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	6152	12	0	1	0	> 14760	< 2	0.39	12.9				
2	1	15402	12	0	1	0	4960	< 2	0.38	18.4				
3	1	15402	12	0	1	0	3660	< 2	0.35	18.2				
4	1	2878	12	0	1	0	4040	< 2	0.39	18.5				
5	1	2092	12	0	1	0	4620	< 2	0.39	17.2				
6	1	1498	12	0	1	0	5320	< 2	0.39	15.3				
7	1	900	12	0	1	0	200	< 2	0.38	14.3				
8	1	1646	12	0	1	0	1240	< 2	0.39	14.3				
9	1	766	12	0	1	0	1720	< 2	0.38	14.0				
10	1	1262	12	0	1	0	1940	< 2	0.38	13.6				
11	1	378	12	0	1	0	340	< 2	0.40	13.3				
12	1	524	12	0	1	0	2000	< 2	0.42	13.8				
13	1	672	12	0	1	0	2240	< 2	0.39	12.4				
14	1	728	12	0	1	0	2560	< 2	0.37	15.1				
15	1	4718	12	0	1	0	8800	< 2	0.36	15.6				
16	1	462	12	0	1	0	4180	< 2	0.36	15.3				
17	1	590	12	0	1	0	7100	< 2	0.38	15.0				
18	1	626	12	0	1	0	1600	< 2	0.38	15.7				
19	1	342	12	0	1	0	2400	< 2	0.39	14.8				
20	1	218	12	0	1	0	1300	< 2	0.43	13.1				
21	1	498	12	0	1	0	1800	< 2	0.44	13.8				
22	1	634	12	0	1	0	3780	< 2	0.44	13.3				
23	1	350	12	0	1	0	1540	< 2	0.43	14.3				
24	1	268	12	0	1	0	960	< 2	0.42	11.7				
25	1	312	12	0	1	0	860	< 2	0.39	11.4				
26	1	264	12	0	1	0	1940	< 2	0.38	12.2				
27	1	690	12	0	1	0	1180	< 2	0.38	11.9				
28	1	256	12	0	1	0	1120	< 2	0.38	11.7				
29	1	518	12	0	1	0	800	< 2	0.39	12.9				
30	1	148	12	0	1	0	660	< 2	0.38	13.2				
31	1	170	12	0	1	0	700	< 2	0.39	11.3				

Avg.									0.39	14.1				
Max.							8800	0	0.44	18.5				
Min.									0.35	11.3				

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Date	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l										
	1	2	3	4	5	6	7	8	CS	WS	Number of Samples
1	0.3	1.4	0.1	0.6	0.2	0.1	0.5	1.8	1.0	1.3	10
2	0.4	1.1	0.1	0.5	0.3	0.1	0.6	1.9	1.2	1.3	10
3											0
4											0
5											0
6	0.3	1.8	0.1	0.6	0.4	0.1	0.1	1.9	1.1	2.0	10
7	0.3	0.1	0.1	0.3	0.1	0.1	0.2	1.8	0.5	0.2	10
8	0.4	0.0	0.1	0.3	0.1	0.1	0.3	1.9	1.5	0.5	10
9	0.3	0.0	0.1	0.5	0.1	0.2	0.1	2.2	0.5	1.5	10
10	0.4	0.0	0.1	0.5	0.2	0.1	0.6	2.3	1.5	1.5	10
11											0
12											0
13											0
14	0.6	0.0	0.1	0.7	0.1	0.1	0.5	2.2	0.7	1.2	10
15	0.3	0.0	0.1	0.5	0.1	0.1	0.3	2.2	0.6	1.0	10
16	0.5	0.0	0.1	0.5	0.3	0.1	0.2	2.6	1.7	0.6	10
17											0
18											0
19											0
20											0
21	0.4	0.2	0.2	0.4	0.3	0.1	0.2	1.5	1.0	1.5	10
22	0.6	0.8	0.4	0.6	0.1	0.1	0.6	2.2	1.9	1.4	10
23	0.4	1.7	0.4	1.0	0.7	0.1	0.5	1.7	1.7	1.7	10
24											0
25											0
26											0
27									1.3	1.0	2
28	0.4	1.7	0.9	0.8	0.7	0.1	0.6	2.0	1.5	1.4	10
29	0.2	1.1	0.1	1.0	0.6	0.1	0.1	1.8	1.4	1.2	10
30	0.1	0.6	0.6	0.7	0.9	0.1	0.3	2.1	1.5	1.1	10
31									1.5	1.3	2

Distribution Sample Summary

Total # of routine distribution samples analyzed	164
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	5
Percent of routine distribution samples positive	3%

See page 9 for positive sample information.

Distribution Disinfectant Total Residual Summary

Percentage of samples with a detectable disinfectant residual	96%
Average disinfectant residual this month	0.72

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	0.6	1.7	0.3	0.9	0.4	0.2	0.7	2.2	1.3	1.5	10
2	0.7	1.4	0.3	0.8	0.6	0.2	0.8	2.4	1.6	1.6	10
3											0
4											0
5											0
6	0.6	2.3	0.3	1.0	0.6	0.2	0.2	2.1	1.4	2.3	10
7	0.6	0.2	0.2	0.5	0.2	0.2	0.4	2.1	0.7	0.3	10
8	0.8	0.1	0.2	0.5	0.2	0.3	0.5	2.3	2.0	0.8	10
9	0.5	0.1	0.2	0.8	0.2	0.2	0.2	2.5	0.8	1.7	10
10	0.6	0.1	0.3	0.9	0.4	0.3	0.8	2.7	1.8	1.8	10
11											0
12											0
13											0
14	1.0	0.0	0.3	1.1	0.3	0.4	0.9	2.5	1.0	1.6	10
15	0.6	0.0	0.3	0.7	0.2	0.2	0.5	2.7	0.9	1.4	10
16	0.9	0.0	0.3	0.9	0.5	0.3	0.4	3.0	2.0	1.0	10
17											0
18											0
19											0
20											0
21	0.7	0.4	0.5	0.7	0.5	0.2	0.4	1.7	1.2	1.8	10
22	1.1	1.2	0.6	1.0	0.1	0.1	0.9	2.5	2.3	2.0	10
23	0.7	2.3	0.7	1.3	0.9	0.2	0.7	2.2	2.2	1.9	10
24											0
25											0
26											0
27									1.5	1.3	2
28	0.7	2.0	1.2	1.1	1.0	0.2	0.9	2.3	1.8	1.7	10
29	0.4	1.5	0.3	1.4	0.9	0.2	0.3	2.3	1.7	1.5	10
30	0.1	1.0	1.0	1.1	1.4	0.2	0.6	2.5	1.8	1.5	10
31									1.8	1.7	2

Distribution Disinfectant Total Residual Summary

Percent samples with a detectable disinfectant residual 100%

Average disinfectant residual this month 1.0

Positive Distribution Samples

[illegible]

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT

WSSN: 2310

Michael Glasgow

Operator-in-Charge

September 2014

Month/Year

F-1R, F-2

Certification of Operator-in-Charge

F-1

Water Plant Classification

Michael Glasgow
Signature of Operator-in-ChargeGenesee

County

Treatment Rate and Filter Data

Maximum Treatment Rate:	<u>24.5</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>97</u>	Hours
Average Head Loss:	<u>n/a</u>	Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>2.1</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>3.4</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>1.9%</u>	Percent of Treated Water

DEQ
RESOURCE MANAGEMENT DIVISION

OCT 20 2014

LANSING DISTRICT

Chemical Data

Chlorine on hand:	<u>16000</u>	lb.	Est. supply:	<u>15</u>	days
Primary Coagulant (Ferric Chloride) on hand:	<u>234,000</u>	lb.	Est. supply:	<u>27</u>	days
Lime (CaO) on hand:	<u>223</u>	tons	Est. supply:	<u>22</u>	days
Fluoride on Hand:	<u>16,630</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:

00

Number of filter confluence samples collected:

180180

Percent of filter confluence samples > 0.3 NTU:

0.0%0.0%

Number of filter confluence samples > 1 NTU

00

Did any individual filter exceed:

1.0 NTU in two consecutive measurements taken 15 minutes apart?

NO

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?

NO

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?

NO

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?

NO

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.

COMPLETED

WSSN: 2310

[illegible]

Filter turbidity

City of Flint Water Treatment Plant

September 2014 Page 3

WSSN: 2310

Date	Turbidity, Units												
	Confluence Point. No.1 (N) North						Confluence Point. No.2 (S) South						Point of Entry
	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	Plant Tap NTU
1	8	0.13	0.18	6	0	0	8	0.13	0.15	6	0	0	0.13
2	8	0.13	0.19	6	0	0	8	0.13	0.15	6	0	0	0.12
3	8	0.13	0.20	6	0	0	8	0.12	0.17	6	0	0	0.12
4	8	0.10	0.13	6	0	0	8	0.10	0.13	6	0	0	0.11
5	8	0.08	0.10	6	0	0	8	0.08	0.10	6	0	0	0.11
6	8	0.09	0.13	6	0	0	8	0.09	0.10	6	0	0	0.11
7	8	0.11	0.15	6	0	0	8	0.11	0.14	6	0	0	0.11
8	8	0.12	0.17	6	0	0	8	0.13	0.20	6	0	0	0.14
9	8	0.12	0.16	6	0	0	8	0.12	0.15	6	0	0	0.12
10	8	0.11	0.12	6	0	0	8	0.12	0.17	6	0	0	0.13
11	8	0.11	0.14	6	0	0	8	0.12	0.14	6	0	0	0.13
12	8	0.09	0.11	6	0	0	8	0.11	0.14	6	0	0	0.12
13	8	0.10	0.11	6	0	0	8	0.10	0.11	6	0	0	0.10
14	8	0.09	0.11	6	0	0	8	0.10	0.13	6	0	0	0.09
15	8	0.08	0.10	6	0	0	8	0.08	0.10	6	0	0	0.08
16	8	0.08	0.09	6	0	0	8	0.08	0.10	6	0	0	0.07
17	8	0.10	0.17	6	0	0	8	0.09	0.12	6	0	0	0.09
18	8	0.11	0.14	6	0	0	8	0.11	0.13	6	0	0	0.10
19	8	0.09	0.11	6	0	0	8	0.11	0.20	6	0	0	0.10
20	8	0.11	0.14	6	0	0	8	0.10	0.12	6	0	0	0.09
21	8	0.10	0.11	6	0	0	8	0.10	0.12	6	0	0	0.09
22	8	0.08	0.10	6	0	0	8	0.07	0.10	6	0	0	0.09
23	8	0.07	0.08	6	0	0	8	0.07	0.08	6	0	0	0.07
24	8	0.08	0.14	6	0	0	8	0.07	0.10	6	0	0	0.08
25	8	0.08	0.09	6	0	0	8	0.09	0.10	6	0	0	0.08
26	8	0.10	0.12	6	0	0	8	0.10	0.12	6	0	0	0.12
27	8	0.09	0.12	6	0	0	8	0.10	0.13	6	0	0	0.09
28	8	0.10	0.11	6	0	0	8	0.09	0.11	6	0	0	0.10
29	8	0.11	0.13	6	0	0	8	0.19	0.10	6	0	0	0.10
30	8	0.13	0.16	6	0	0	8	0.11	0.14	6	0	0	0.11
Avg.	8	0.10	0.13	6	0	0	8	0.10	0.13	6	0	0	
Max.	8	0.13	0.20	6	0	0	8	0.19	0.20	6	0	0	0.14
Min.	8	0.07	0.08	6	0	0	8	0.07	0.08	6	0	0	

Fluoridation &
ChlorinationCity of Flint Water Treatment Plant
WSSN: 2310

September 2014

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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	0.50	0.19	0.72		3.6	3.6	7.2	0.3	0.6	2.7	3.3	1.5	1.9
2	0.50	0.18	0.70	0.63	3.7	3.5	7.2	0.4	0.8	2.5	3.2	1.2	1.8
3	0.50	0.19	0.69		3.6	3.6	7.2	0.4	0.7	1.9	2.4	1.2	1.9
4	0.50	0.19	0.69		3.6	3.6	7.2	0.5	0.9	2.6	3.2	1.7	2.2
5	0.50	0.20	0.69		3.6	3.3	6.9	0.5	0.8	2.0	2.6	1.6	1.9
6	0.50	0.21	0.65		3.6	3.6	7.2	0.3	0.7	2.2	2.7	1.4	1.8
7	0.40	0.20	0.62		3.2	3.5	6.7	0.2	0.5	2.2	2.7	1.2	1.8
8	0.50	0.19	0.57		3.6	4.1	7.7	0.5	0.8	2.5	3.0	1.7	2.2
9	0.50	0.20	0.69	0.69	3.8	4.1	7.9	0.6	0.9	3.1	3.4	3.0	3.3
10	0.50	0.19	0.69		3.8	3.9	7.7	0.6	0.9	3.2	3.5	1.8	2.1
11	0.50	0.19	0.69		3.9	4.0	7.9	0.5	0.9	2.7	3.2	3.1	3.5
12	0.50	0.18	0.70		3.7	3.8	7.5	0.5	0.8	2.9	3.5	2.1	2.7
13	0.50	0.16	0.69		3.5	3.8	7.3	0.4	0.7	2.9	3.5	2.1	2.9
14	0.40	0.20	0.69		3.6	4.2	7.8	0.6	0.9	3.0	3.5	3.0	3.5
15	0.40	0.19	0.64		3.4	3.7	7.1	0.9	1.4	3.2	3.5	3.0	3.5
16	0.40	0.20	0.64	0.65	3.0	3.6	6.6	0.8	1.1	2.6	3.2	1.9	2.4
17	0.50	0.17	0.65		2.9	3.9	6.8	0.6	1.2	2.8	3.5	2.4	3.1
18	0.40	0.18	0.65		2.4	3.5	5.9	0.6	1.0	3.2	3.5	3.0	3.3
19	0.40	0.18	0.66		2.4	3.4	5.8	0.4	0.8	2.6	3.2	2.1	2.8
20	0.50	0.24	0.65		2.5	4.2	6.7	0.4	0.7	2.7	3.3	1.9	2.3
21	0.50	0.18	0.70		2.4	4.2	6.6	0.5	0.9	3.1	3.5	3.2	3.4
22	0.40	0.19	0.66		3.0	4.8	7.8	0.9	1.3	3.2	3.5	3.3	3.5
23	0.40	0.20	0.60	0.63	2.9	3.7	6.6	0.7	1.1	3.2	3.5	2.3	2.6
24	0.40	0.20	0.64		2.9	3.6	6.5	1.0	1.5	2.9	3.5	3.1	3.3
25	0.40	0.19	0.64		2.5	3.7	6.2	0.7	1.0	3.2	3.5	2.2	2.6
26	0.40	0.21	0.65		2.5	4.2	6.7	0.6	1.0	2.7	3.2	2.2	2.6
27	0.40	0.19	0.65		2.5	4.1	6.6	0.6	0.9	3.0	3.5	2.0	2.6
28	0.40	0.23	0.71		2.6	4.0	6.6	0.9	1.3	3.1	3.5	3.1	3.5
29	0.50	0.21	0.70		2.6	4.0	6.6	0.8	1.2	3.1	3.5	3.0	3.5
30	0.50	0.21	0.67	0.65	2.5	4.3	6.8	0.7	1.0	2.9	3.5	2.4	2.7
Avg.	0.46	0.19	0.67	0.65	3.1	3.9	7.0	0.6	0.9	2.8	3.3	2.3	2.7
Max.	0.50	0.24	0.72	0.69	3.9	4.8	7.9	1.0	1.5	3.2	3.5	3.3	3.5
Min.	0.40	0.16	0.57	0.63	2.4	3.3	5.8	0.2	0.5	1.9	2.4	1.2	1.8

Chemical
Analyses

City of Flint Water Treatment Plant

September 2014

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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	8.06	7.47	248	170	200	104	48	66	72.1	61.7	14.6	3.4	41	60
2	7.90	7.79	235	160	200	97	35	63	71.3	54.5	14.1	4.4	44	61
3	8.00	7.92	240	165	196	97	44	68	82.6	64.1	7.8	1.9	40	66
4	8.04	7.93	238	160	200	97	38	63	74.5	56.9	12.6	3.9	40	59
5	8.09	7.61	241	146	198	81	43	65	76.2	57.7	11.7	1.0	42	57
6	7.95	7.94	239	148	198	79	41	69	79.4	57.7	10.2	1.0	40	57
7	8.09	7.77	238	153	202	97	36	56	65.7	48.1	18.5	2.9	41	58
8	7.97	7.88	240	169	203	94	37	75	77.0	54.5	11.7	8.3	42	59
9	7.88	7.89	241	170	203	103	38	67	73.7	57.5	13.6	6.3	43	62
10	7.78	7.95	242	170	202	95	40	75	81.8	60.1	16.5	6.3	42	60
11	7.91	7.92	244	169	204	96	40	73	80.2	64.9	10.2	4.4	43	59
12	8.00	7.66	240	168	197	101	43	67	81.0	65.7	9.7	1.0	42	60
13	8.04	7.61	245	175	199	96	46	79	76.2	63.3	13.6	3.9	43	59
14	8.18	7.44	247	162	206	85	41	77	79.4	55.3	12.2	5.8	42	59
15	8.24	7.62	246	150	204	81	42	69	72.9	45.7	15.6	6.3	41	61
16	8.22	7.61	246	153	206	83	40	70	68.5	46.5	18.2	8.3	42	61
17	8.23	7.89	246	142	197	72	49	70	81.8	53.7	11.2	2.4	42	59
18	8.29	7.99	246	147	208	76	38	71	76.2	44.9	13.6	7.3	41	60
19	8.29	8.11	251	145	205	71	46	74	79.4	52.7	10.7	2.4	42	56
20	8.26	8.02	248	156	202	89	46	67	79.4	55.3	12.2	3.4	43	58
21	8.23	7.84	247	162	209	93	38	69	77.0	49.7	13.6	9.2	43	61
22	8.22	8.05	245	160	205	79	40	81	78.6	52.9	12.2	8.3	43	62
23	8.35	7.88	249	144	204	64	45	80	70.5	38.5	17.5	11.2	42	63
24	8.41	7.96	243	120	199	51	44	69	85.0	40.1	8.3	4.9	44	62
25	8.40	7.77	239	138	202	66	37	72	72.1	41.7	12.6	7.8	40	61
26	8.35	7.90	242	139	197	60	45	79	89.0	49.7	11.2	3.9	42	60
27	8.23	7.85	240	133	192	60	48	73	92.2	50.5	9.7	2.4	42	61
28	8.23	7.85	246	128	204	62	42	66	72.9	40.9	15.6	5.3	41	63
29	8.15	7.84	242	144	202	68	40	76	72.9	43.3	14.6	7.8	41	63
30	8.01	7.52	247	153	205	68	42	85	93.8	56.1	11.2	3.9	42	62

Avg.	8.13	7.82	243	153	202	82	42	71	77.8	52.8	12.8	5.0	42	60
Max.	8.41	8.11	251	175	209	104	49	85	93.8	65.7	18.5	11.2	44	66
Min.	7.78	7.44	235	120	192	51	35	56	65.7	38.5	7.8	1.0	40	56

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
WSSN: 2310

September 2014

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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	8212	12	0	1	0	3780	2	0.42	24.0				
2	1	12262	12	0	1	0	4620	< 2	0.42	24.0				
3	1	3912	12	0	1	0	1360	< 2	n.t.	23.8				
4	1	2749	12	0	1	0	1600	< 2	0.42	26.1				
5	1	1918	12	0	1	0	1720	< 2	0.39	24.1				
6	1	8212	12	0	1	0	2160	< 2	0.39	23.9				
7	1	5510	12	0	1	0	2640	< 2	0.41	23.5				
8	1	2910	12	0	1	0	2480	< 2	0.44	23.0				
9	1	2708	12	0	1	0	6980	< 2	0.44	23.4				
10	1	7308	12	0	1	0	> 14760	< 2	n.t.	23.5				
11	1	6510	12	0	1	0	8800	< 2	0.43	22.1				
12	1	8704	12	0	1	0	8800	< 2	0.43	21.4				
13	1	3570	12	0	1	0	3120	< 2	0.44	20.9				
14	1	8212	12	0	1	0	1360	< 2	0.38	20.0				
15	1	6510	12	0	1	0	3540	< 2	0.37	18.1				
16	1	12262	12	0	1	0	1660	< 2	0.37	17.7				
17	1	9222	12	0	1	0	1940	< 2	0.38	17.5				
18	1	10950	12	0	1	0	2400	< 2	0.36	17.4				
19	1	6152	12	0	1	0	6220	< 2	0.37	17.0				
20	1	5818	12	0	1	0	6780	< 2	0.37	18.0				
21	1	4028	12	0	1	0	2740	< 2	0.40	18.4				
22	1	12262	12	0	1	0	3900	< 2	0.39	18.0				
23	1	10950	12	0	1	0	4780	< 2	0.39	17.5				
24	1	10344	12	0	1	0	2560	< 2	0.36	17.6				
25	1	8704	12	0	1	0	2640	< 2	0.35	18.2				
26	1	15402	12	0	1	0	5740	< 2	0.36	18.6				
27	1	5226	12	0	1	0	7440	< 2	0.36	18.5				
28	1	7746	12	0	1	0	6780	< 2	0.35	19.4				
29	1	3578	12	0	1	0	5320	< 2	0.37	19.5				
30	1	31062	12	0	1	0	3320	< 2	0.38	19.2				

n.t.= not tested

Avg.									0.39	20.5				
Max.							8800	2	0.44	26.1				
Min.									0.35	17.0				

Date	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l										
	1	2	3	4	5	6	7	8	CS	WS	Number of Samples
1											0
2	0.1	0.4	0.1	0.2	0.0	0.1	0.1	0.8	0.4	0.9	10
3	0.1	0.3	0.1	0.2	0.0	0.1	0.1	0.7	0.5	0.5	10
4	0.1	0.3	0.1	0.2	0.1	0.1	0.1	0.8	0.2	0.8	10
5											0
6											0
7											0
8	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.7	0.6	0.7	10
9	0.3	0.6	0.1	0.1	0.1	0.1	0.2	1.5	1.5	0.5	10
10	0.3	0.8	0.1	0.1	0.2	0.1	0.2	1.5	3.5	1.2	10
11	0.3	0.9	0.1	0.4	0.2	0.1	0.1	1.3	1.4	1.6	10
12											0
13											0
14											0
15											0
16	0.2	0.6	0.1	0.4	0.1	0.2	0.1	1.3	0.9	1.3	10
17	0.3	1.2	0.1	1.0	0.2	0.0	0.1	1.7	2.7	1.5	10
18	0.2	0.7	0.1	0.4	0.2	0.2	0.2	1.7	0.8	1.4	10
19											0
20											0
21											0
22											0
23	0.3	1.6	0.1	0.8	0.2	0.2	0.3	2.3	1.1	0.9	10
24	0.5	1.5	0.2	0.7	0.6	0.1	1.0	2.1	1.7	2.1	10
25	0.3	0.1	0.1	0.7	0.2	0.1	0.2	1.7	3.5	2.3	10
26	0.5	0.1	0.1	0.9	0.5	0.1	0.4	2.2	3.5	1.7	10
27											0
28											0
29											0
30	0.5	0.1	0.1	0.7	0.1	0.1	0.6	2.4	1.8	1.7	10

Distribution Sample Summary

Total # of routine distribution samples analyzed	150
Total # of routine distribution samples required	100

Distribution Bacteriological Summary

Total # of positive routine distribution samples	15
Percent of routine distribution samples positive	10%

Distribution Disinfectant Total Residual Summary

Percentage of samples with a detectable disinfectant residual	97%
Average disinfectant residual this month	0.64

See page 9 for positive sample information.

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	0.7	0.2	0.4	0.1	0.2	0.2	1.2	0.7	1.2	10
3	0.3	0.7	0.2	0.5	0.2	0.4	0.3	1.2	0.9	1.0	10
4	0.3	0.6	0.2	0.3	0.2	0.2	0.2	1.1	0.3	1.1	10
5											0
6											0
7											0
8	0.2	0.4	0.1	0.2	0.2	0.1	0.1	1.0	0.9	1.0	10
9	0.6	1.3	0.3	0.3	0.3	0.2	0.4	1.8	1.8	0.8	10
10	0.5	1.1	0.2	0.2	0.4	0.2	0.4	1.8	3.5	1.4	10
11	0.6	1.2	0.3	0.8	0.4	0.3	0.3	1.6	1.8	2.0	10
12											0
13											0
14											0
15											0
16	0.4	1.0	0.2	0.7	0.3	0.3	0.3	1.7	1.2	1.7	10
17	0.5	1.6	0.3	1.4	0.5	0.2	0.3	2.1	3.5	2.0	10
18	0.3	1.0	0.2	0.7	0.3	0.4	0.3	2.1	1.0	1.7	10
19											0
20											0
21											0
22											0
23	0.5	1.9	0.3	1.1	0.3	0.3	0.5	2.5	1.6	1.1	10
24	0.9	0.2	0.4	1.3	1.0	0.3	1.5	2.5	2.0	1.7	10
25	0.6	0.2	0.2	0.9	0.5	0.2	0.4	2.2	3.5	3.0	10
26	0.9	0.3	0.3	1.4	1.1	0.3	0.7	2.7	3.5	2.0	10
27											0
28											0
29											0
30	0.8	0.3	0.3	1.1	0.3	0.2	1.1	2.7	2.2	2.1	10

Distribution Disinfectant Total Residual Summary

Percent samples with a detectable disinfectant residual 100%

Average disinfectant residual this month 0.9

Positive Distribution Samples

Date	Monitoring station	Date	Repeat Monitoring Stations	Residual (mg/L) Free / Total	Present or Absent
9/2/2014	2501 Flushing Rd	9/3/2014	2501 Flushing Rd	0.0 / 0.2	Present
			1117 N. Chevrolet	0.0 / 0.2	Present
			2740 Flushing Rd	0.1 / 0.3	Absent
		9/4/2014	2501 Flushing Rd	0.1 / 0.2	Present
			2205 N. Chevrolet	0.1 / 0.2	Present
			2740 Flushing Rd	0.1 / 0.3	Present
		9/5/2014	2501 Flushing Rd	0.1 / 0.2	Present
			2205 N. Chevrolet	0.1 / 0.3	Absent
			2740 Flushing Rd	0.1 / 0.2	Present
		9/6/2014	2501 Flushing Rd	0.2 / 0.3	Absent
			2205 Flushing Rd.	0.2 / 0.3	Absent
			1274 Ballenger Hwy	0.1 / 0.2	Absent
		9/7/2014	2501 Flushing Rd	0.2 / 0.3	Absent
			2205 Flushing Rd.	0.2 / 0.3	Absent
			1274 Ballenger Hwy	0.0 / 0.2	Present
		9/8/2014	2501 Flushing Rd	0.1 / 0.2	Absent
			1274 Ballenger Hwy	0.1 / 0.1	Absent
9/4/2014	3216 MLK Blvd.	9/5/2014	3216 MLK Blvd.	0.2 / 0.3	Absent
			3317 MLK Blvd.	0.1 / 0.2	Present
			3110 MLK Blvd.	0.1 / 0.2	Present
		9/6/2014	104 E. Pasadena Ave.	0.1 / 0.2	Absent
			3317 MLK Blvd.	0.2 / 0.3	Absent
			3110 MLK Blvd.	0.0 / 0.1	Absent
		9/7/2014	104 E. Pasadena Ave.	0.1 / 0.3	Absent
			3317 MLK Blvd.	0.1 / 0.3	Absent
			3110 MLK Blvd.	0.2 / 0.3	Absent
9/10/2014	3606 Corunna Rd.	9/11/2014	3606 Corunna Rd.	0.4 / 0.8	Absent
			3521 Corunna Rd.	0.3 / 0.5	Absent
			3614 Corunna Rd.	0.7 / 1.0	Absent
9/16/2014	3606 Corunna Rd.	9/17/2014	3606 Corunna Rd.	1.0 / 1.4	Absent
			3521 Corunna Rd.	0.7 / 1.0	Absent
			3614 Corunna Rd.	1.5 / 2.0	Absent
9/17/2014	3302 S. Dort Hwy	9/18/2014	3302 S. Dort Hwy	0.1 / 0.2	Absent
			3124 S. Dort Hwy	0.1 / 0.2	Absent
			3316 S. Dort Hwy.	0.1 / 0.2	Absent

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT
 WSSN: 2310

Michael Glasgow

Operator-in-Charge

August 2014

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

DEQ

RESOURCE MANAGEMENT DIVISION

Treatment Rate and Filter Data

Maximum Treatment Rate:	<u>24.4</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>78</u>	Hours
Average Head Loss:		Feet *(filter head loss meters not operational)
Average Filtration Rate:	<u>2.2</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>2.8%</u>	Percent of Treated Water

SEP 17 2014

LANSING DISTRICT

Chemical Data

Chlorine on hand:	<u>12000</u>	lb.	Est. supply:	<u>10</u>	days
Primary Coagulant (Ferric Chloride) on hand:	<u>209,000</u>	lb.	Est. supply:	<u>23</u>	days
Lime (CaO) on hand:	<u>78</u>	tons	Est. supply:	<u>8</u>	days
Fluoride on Hand:	<u>23,280</u>	lb.	Est. supply:	<u>38</u>	days
Cost of All Chemicals per Million Gallons:		dollars			
Total Power Cost per Million Gallons:		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>186</u>	<u>186</u>
Percent of filter confluence samples > 0.3 NTU:	<u>0.00%</u>	<u>0.00%</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.

COMPLETED

[illegible]

Filter turbidity

City of Flint Water Treatment Plant
WSSN: 2310

August 2014

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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	6	0.07	0.11	6	0	0	6	0.07	0.08	6	0	0	0.08
2	6	0.06	0.08	6	0	0	6	0.07	0.09	6	0	0	0.08
3	6	0.06	0.07	6	0	0	6	0.08	0.09	6	0	0	0.08
4	6	0.09	0.11	6	0	0	6	0.09	0.10	6	0	0	0.08
5	6	0.11	0.13	6	0	0	6	0.10	0.11	6	0	0	0.10
6	6	0.08	0.10	6	0	0	6	0.08	0.10	6	0	0	0.09
7	6	0.11	0.13	6	0	0	6	0.11	0.14	6	0	0	0.10
8	6	0.08	0.09	6	0	0	6	0.09	0.10	6	0	0	0.09
9	6	0.09	0.12	6	0	0	6	0.09	0.12	6	0	0	0.09
10	6	0.11	0.14	6	0	0	6	0.08	0.09	6	0	0	0.10
11	6	0.10	0.11	6	0	0	6	0.09	0.13	6	0	0	0.10
12	6	0.09	0.10	6	0	0	6	0.11	0.16	6	0	0	0.11
13	6	0.13	0.16	6	0	0	6	0.12	0.15	6	0	0	0.12
14	6	0.12	0.13	6	0	0	6	0.11	0.11	6	0	0	0.12
15	6	0.14	0.16	6	0	0	6	0.15	0.17	6	0	0	0.14
16	6	0.19	0.23	6	0	0	6	0.18	0.19	6	0	0	0.17
17	6	0.16	0.21	6	0	0	6	0.13	0.15	6	0	0	0.13
18	6	0.15	0.16	6	0	0	6	0.14	0.16	6	0	0	0.13
19	6	0.11	0.13	6	0	0	6	0.11	0.14	6	0	0	0.13
20	6	0.09	0.11	6	0	0	6	0.08	0.15	6	0	0	0.10
21	6	0.07	0.08	6	0	0	6	0.08	0.19	6	0	0	0.07
22	6	0.09	0.11	6	0	0	6	0.07	0.08	6	0	0	0.09
23	6	0.08	0.09	6	0	0	6	0.08	0.10	6	0	0	0.09
24	6	0.08	0.09	6	0	0	6	0.07	0.10	6	0	0	0.09
25	6	0.09	0.12	6	0	0	6	0.07	0.08	6	0	0	0.09
26	6	0.10	0.16	6	0	0	6	0.10	0.11	6	0	0	0.09
27	6	0.10	0.13	6	0	0	6	0.10	0.12	6	0	0	0.11
28	6	0.11	0.13	6	0	0	6	0.10	0.12	6	0	0	0.10
29	6	0.12	0.14	6	0	0	6	0.12	0.14	6	0	0	0.11
30	6	0.11	0.15	6	0	0	6	0.10	0.12	6	0	0	0.12
31	6	0.13	0.16	6	0	0	6	0.12	0.13	6	0	0	0.15
Avg.	6	0.10	0.13	6	0	0	6	0.10	0.12	6	0	0	
Max.	6	0.19	0.23	6	0	0	6	0.18	0.19	6	0	0	0.17
Min.	6	0.06	0.07	6	0	0	6	0.07	0.08	6	0	0	

**Fluoridation &
Chlorination**

 City of Flint Water Treatment Plant
WSSN: 2310

August 2014

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Date	Fluoride Applied as F- mg/L	Fluoride Analysis (mg/L)			Chlorine Application (mg/L)			Chlorine Residual (mg/L)					
					Intermediat e Chlorine	Post Chlorine	Total Chlorine	Filtered		3 MG Well		Tap	
		Raw	Tap	Dist.				Free	Total	Free	Total	Free	Total
1	0.50	0.18	0.64		3.3	3.9	7.2	0.6	0.8	2.5	2.9	1.8	2.1
2	0.50	0.19	0.66		3.2	3.8	7.0	0.7	0.9	2.3	2.7	1.3	1.5
3	0.50	0.20	0.68		3.0	4.0	7.0	0.6	0.8	2.4	2.9	1.5	1.8
4	0.50	0.19	0.71		3.1	3.5	6.6	0.4	0.6	1.9	2.3	1.3	1.6
5	0.50	0.20	0.68		3.6	3.7	7.3	0.7	1.0	2.8	3.2	2.2	2.5
6	0.50	0.20	0.76	0.72	3.8	3.9	7.7	0.9	1.2	3.0	3.5	3.3	3.5
7	0.40	0.19	0.67		3.4	4.3	7.7	0.5	0.8	2.6	2.9	1.9	2.3
8	0.50	0.19	0.67		3.4	3.4	6.8	0.7	1.0	3.2	3.5	2.0	2.5
9	0.50	0.18	0.70		3.2	2.9	6.1	0.4	0.6	1.9	2.3	1.5	1.7
10	0.50	0.18	0.71		3.2	3.4	6.6	0.5	0.8	1.9	2.4	1.3	1.6
11	0.50	0.19	0.69		3.1	3.3	6.4	0.7	1.1	2.8	3.3	2.2	2.6
12	0.50	0.19	0.72	0.68	2.6	3.8	6.4	1.1	1.3	3.0	3.5	1.5	2.0
13	0.40	0.17	0.57		2.8	4.4	7.2	0.3	0.5	3.0	3.5	2.2	2.7
14	0.40	0.17	0.58		3.5	3.9	7.4	0.2	0.3	2.0	2.5	1.1	1.5
15	0.40	0.18	0.59		3.5	3.5	7.0	0.4	0.6	2.3	2.7	1.2	1.6
16	0.40	0.20	0.59		3.3	3.6	6.9	0.4	0.6	1.9	2.3	1.4	1.8
17	0.40	0.19	0.59		3.1	3.7	6.8	0.3	0.6	2.0	2.5	1.6	1.9
18	0.40	0.19	0.58		3.2	3.6	6.8	0.3	0.6	2.2	3.0	1.0	1.4
19	0.40	0.18	0.57	0.57	3.8	3.4	7.2	0.7	1.2	3.0	3.5	1.8	2.3
20	0.30	0.20	0.57		3.4	3.0	6.4	0.6	1.0	2.6	3.0	0.8	1.0
21	0.50	0.18	0.53		3.4	3.0	6.4	0.7	0.9	2.1	2.7	1.4	1.6
22	0.50	0.18	0.70		3.4	2.8	6.2	0.6	1.0	2.3	3.0	1.6	2.2
23	0.50	0.16	0.67		3.3	3.0	6.3	0.4	0.7	2.3	2.8	1.1	1.5
24	0.50	0.19	0.68		3.3	2.9	6.2	0.5	0.9	2.5	3.1	1.0	1.5
25	0.50	0.18	0.63		3.0	3.2	6.2	0.6	1.0	2.4	3.3	1.1	1.5
26	0.50	0.19	0.77	0.64	3.0	3.6	6.6	0.2	0.4	2.4	2.9	0.8	1.1
27	0.50	0.19	0.71		3.3	3.5	6.8	0.4	0.7	2.5	3.0	1.8	2.3
28	0.50	0.20	0.71		3.4	3.3	6.7	0.3	0.6	2.0	2.5	1.2	1.6
29	0.40	0.18	0.55		3.3	3.5	6.8	0.3	0.6	2.3	2.8	1.2	1.6
30	0.40	0.18	0.63		3.6	3.6	7.2	0.2	0.6	2.1	2.6	1.0	1.3
31	0.40	0.19	0.83		4.1	4.4	8.5	0.8	1.3	3.0	3.5	3.0	3.4
Avg.	0.46	0.19	0.66	0.65	3.3	3.5	6.9	0.5	0.8	2.4	2.9	1.6	1.9
Max.	0.50	0.20	0.83	0.72	4.1	4.4	8.5	1.1	1.3	3.2	3.5	3.3	3.5
Min.	0.30	0.16	0.53	0.57	2.6	2.8	6.1	0.2	0.3	1.9	2.3	0.8	1.0

Chemical
AnalysesCity of Flint Water Treatment Plant
WSSN: 2310

August 2014

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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	8.10	7.74	237	173	196	77	41	96	88.2	64.9	4.4	3.4	41	75
2	8.14	7.62	240	173	195	77	45	96	89.8	66.5	7.3	2.0	40	77
3	8.22	7.45	239	176	199	86	40	90	70.5	57.5	15.1	7.8	41	76
4	8.36	7.43	233	172	193	84	40	88	72.1	65.7	13.1	2.9	39	74
5	8.02	8.05	229	149	194	74	35	75	70.5	44.1	11.7	11.2	40	64
6	7.96	7.74	232	144	192	50	40	94	69.7	44.1	14.1	8.3	40	65
7	7.99	7.89	231	163	195	85	36	78	67.3	48.9	14.6	8.3	41	67
8	7.96	7.94	248	153	196	70	52	83	67.3	44.9	21.4	9.2	38	65
9	8.39	7.75	242	150	195	75	47	75	64.9	56.1	19.9	2.9	42	62
10	8.20	7.97	239	152	197	72	42	80	87.4	56.1	5.3	2.4	43	62
11	8.32	7.93	236	142	197	75	39	67	70.5	48.1	14.6	6.8	39	64
12	8.19	7.87	235	143	193	79	42	64	68.1	47.3	15.6	4.4	38	58
13	7.98	7.71	221	148	185	89	36	59	60.9	44.1	15.6	7.3	39	61
14	7.59	7.64	227	159	190	92	37	67	66.5	52.1	14.6	7.8	38	61
15	8.02	7.88	235	169	193	98	42	71	87.4	62.5	6.8	3.9	40	60
16	8.09	7.99	237	174	191	101	46	73	85.0	62.5	5.8	4.9	41	59
17	8.01	8.09	231	164	192	92	39	72	88.2	60.9	6.8	3.4	39	60
18	8.07	7.72	236	153	196	92	40	61	63.3	46.5	18.9	8.7	39	60
19	7.97	7.99	236	151	197	85	39	66	87.4	52.1	4.9	3.9	39	62
20	8.04	7.65	226	147	189	87	37	60	67.3	48.1	13.6	7.3	38	61
21	8.13	7.94	233	139	192	79	41	60	71.3	48.9	13.6	3.4	41	60
22	8.33	7.64	234	149	189	84	45	65	70.5	48.1	13.1	8.3	39	59
23	8.13	7.88	229	146	195	69	34	77	68.9	49.7	14.1	5.8	40	57
24	8.26	7.60	230	149	195	88	35	61	70.5	50.5	12.2	5.3	42	60
25	8.14	7.65	235	142	194	77	41	65	71.3	48.9	13.1	3.4	40	60
26	8.15	7.61	234	155	194	87	40	68	88.2	54.4	6.3	4.4	41	58
27	8.01	7.61	242	152	200	86	42	66	76.2	52.9	12.2	3.9	40	60
28	8.06	7.73	243	157	198	87	45	70	89.8	60.1	5.8	1.0	42	60
29	7.95	8.01	241	153	197	83	44	70	86.6	56.9	5.3	1.9	44	63
30	7.85	7.75	235	160	193	86	42	74	85.8	56.9	5.3	4.9	43	60
31	8.02	7.77	239	157	200	91	39	66	77.0	50.5	11.7	5.8	45	65
Avg.	8.09	7.78	235	155	194	82	41	73	75.8	53.3	11.5	5.3	40	63
Max.	8.39	8.09	248	176	200	101	52	96	89.8	66.5	21.4	11.2	45	77
Min.	7.59	7.43	221	139	185	50	34	59	60.9	44.1	4.4	1.0	38	57

**Bacteriological &
Physical Parameters**

 City of Flint Water Treatment Plant
WSSN: 2310

August 2014

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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	7380	12	0	1	0	8280	< 2	0.50	21.8				
2	1	5510	12	0	1	0	5740	< 2	0.50	22.3				
3	1	4962	12	0	1	0	1060	< 2	0.45	24.7				
4	1	4286	12	0	1	0	1940	< 2	0.44	24.9				
5	1	1976	12	0	1	0	2740	< 2	0.50	23.7				
6	1	10950	12	0	1	0	11100	< 2	0.39	23.5				
7	1	18416	12	0	1	0	8280	< 2	0.43	23.3				
8	1	22398	12	0	1	0	>14760	< 2	0.41	23.6				
9	1	4564	12	0	1	0	>14760	< 2	0.50	24.2				
10	1	2028	12	0	1	0	9400	< 2	0.50	23.9				
11	1	3214	12	0	1	0	2080	< 2	0.42	25.2				
12	1	2752	12	0	1	0	1940	< 2	0.40	23.9				
13	1	6152	12	0	1	0	>14760	< 2	0.37	22.5				
14	1	1618	12	0	1	0	>14760	< 2	0.43	22.4				
15	1	2134	12	0	1	0	5740	< 2	0.44	22.1				
16	1	1232	12	0	1	0	12460	< 2	0.44	21.9				
17	1	1424	12	0	1	0	5140	< 2	0.41	21.4				
18	1	2802	12	0	1	0	8280	< 2	0.40	22.0				
19	1	1672	12	0	1	0	5520	< 2	0.40	22.5				
20	1	6882	12	0	1	0	>14760	< 2	0.40	22.8				
21	1	7304	12	0	1	0	1360	2	0.38	22.9				
22	1	8704	12	0	1	0	3420	< 2	0.40	22.5				
23	1	4564	12	0	1	0	>14760	< 2	0.38	24.7				
24	1	3328	12	0	1	0	1300	< 2	0.39	23.2				
25	1	3446	12	0	1	0	900	< 2	0.39	24.5				
26	1	4196	12	0	1	0	2000	2	0.40	25.0				
27	1	4284	12	0	1	0	1060	< 2	0.40	23.9				
28	1	3446	12	0	1	0	1360	< 2	0.41	22.7				
29	1	1424	12	0	1	0	12460	< 2	0.43	23.4				
30	1	4028	12	0	1	0	14760	< 2	0.42	23.5				
31	1	3232	12	0	1	0	2320	< 2	0.42	23.8				
Avg.									0.42	23.3				
Max.							14760	2	0.50	25.2				
Min.									0.37	21.4				

Distribution Bacteriological Summary	
Total # of positive routine distribution samples	15
Percent of routine distribution samples positive	12%

Positive Distribution Samples					
Date	Monitoring Station	Date	Repeat Monitoring Stations	Residual	Positive or Negative
	See page 9				

**Distribution System
Monitoring**

 City of Flint Water Treatment Plant
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August 2014

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Date	Total Chlorine Residual at Bacteriological Monitoring Stations mg/l										Number of Samples
	1	2	3	4	5	6	7	8	CS	WR	
1											0
2											0
3											0
4											0
5											0
6	0.6	1.1	0.5	0.5	0.2	0.3	0.2	1.2	0.5	0.3	10
7	0.9	1.3	0.5	0.9	0.4	0.4	0.3	1.2	0.4	2.0	10
8											0
9											0
10											0
11											0
12	0.3	0.6	0.3	0.2	0.1	0.3	0.2	0.7	0.1	0.1	10
13	0.4	0.5	0.2	0.7	0.1	0.3	0.1	1.5	0.1	1.6	10
14	0.7	1.1	0.4	0.4	0.1	0.2	0.1	1.4	0.9	0.6	10
15											0
16											0
17											0
18											0
19	0.3	0.6	0.2	0.3	0.1	0.2	0.1	1.3	0.9	1.1	10
20	0.4	1.2	0.3	0.7	0.3	0.4	0.5	1.5	0.7	1.0	10
21	0.4	1.1	0.4	0.3	0.1	0.2	0.2	1.3	0.3	1.1	10
22	0.4	1.0	0.4	0.9	0.5	0.2	0.1	1.1	0.8	1.4	10
23											0
24											0
25											0
26	0.3	0.9	0.9	0.6	0.1	0.5	0.3	1.3	1.5	1.2	10
27	0.3	0.7	0.2	0.3	0.2	0.2	0.2	1.1	0.7	0.8	10
28	0.5	0.7	0.3	0.8	0.3	0.5	0.3	1.5	1.6	1.5	10
29									1.3	1.5	2
30											0
31											0

Distribution Disinfectant Total Residual Summary

Percent samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	0.6

Positive Distribution Samples

Date	Monitoring station	Date	Repeat Monitoring Stations	Present or Absent
8/12/2014	3606 Corunna Rd	8/13/2014	3606 Corunna Rd	Present
		8/13/2014	3521 Corunna Rd	Present
		8/13/2014	3614 Corunna Rd.	Present
8/12/2014	2501 Flushing Rd	8/13/2014	2501 Flushing Rd	Present
		8/13/2014	1117 N. Chevrolet	Present
		8/13/2014	2740 Flushing Rd	Present
8/12/2014	1100 Cedar St.	8/13/2014	1100 Cedar St.	Present
		8/13/2014	1035 Ann Arbor St	Present
		8/13/2014	702 W. 12th St	Absent
8/14/2014	2501 Flushing Rd	8/15/2014	2501 Flushing Rd	Absent
		8/15/2014	1117 N. Chevrolet	Present
		8/15/2014	2740 Flushing Rd	Absent
		8/16/2014	2501 Flushing Rd	Absent
		8/16/2014	1117 N. Chevrolet	Present
		8/16/2014	2740 Flushing Rd	Absent
		8/17/2014	1117 N. Chevrolet	Absent
		8/18/2014	2501 Flushing Rd	Absent
		8/18/2014	1117 N. Chevrolet	Absent
		8/18/2014	2740 Flushing Rd	Absent
8/22/2014	5018 Clio Rd.	8/23/2014	5018 Clio Rd.	Absent
		8/23/2014	5005 Cloverlawn Dr.	Absent
		8/23/2014	4930 Clio Rd.	Absent

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT
 WSSN: 2310

Michael Glasgow
 Operator-in-Charge

July 2014
 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>24.5</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>65</u>	Hours
Average Head Loss:	<u>*</u>	Feet *(filter head loss in feet)
Average Filtration Rate	<u>2.3</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>3.8</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>2.5%</u>	Percent of Treated Water

DEQ
 RESOURCE MANAGEMENT DIVISION

AUG 14 2014

GENESEE COUNTY

Chemical Data

Chlorine on hand:	<u>21000</u> lb.	Est. supply:	<u>16</u> days
Primary Coagulant (Ferric Chloride) on hand:	<u>174,603</u> lb.	Est. supply:	<u>23</u> days
Lime (CaO) on hand:	<u>219</u> tons	Est. supply:	<u>21</u> days
Fluoride on Hand:	<u>16,348</u> lb.	Est. supply:	<u>27</u> days
Cost of All Chemicals per Million Gallons:	<u> </u> dollars		
Total Power Cost per Million Gallons:	<u> </u> dollars		

Remarks

Confluence Point # 1 (N)

Confluence Point # 2 (S)

Number of filter confluence samples > 0.3 NTU:

00

Number of filter confluence samples collected:

186186

Percent of filter confluence samples > 0.3 NTU:

0.00%0.00%

Number of filter confluence samples > 1 NTU

00

Did any individual filter exceed:

1.0 NTU in two consecutive measurements taken 15 minutes apart?

NO

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?

NO

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?

NO

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?

NO

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.

COMPLETED
 11/15

[illegible]

Filter turbidity

City of Flint Water Treatment Plant
WSSN: 2310

July 2014

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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	6	0.07	0.10	6	0	0	6	0.07	0.10	6	0	0	0.11
2	6	0.08	0.10	6	0	0	6	0.07	0.11	6	0	0	0.21
3	6	0.08	0.10	6	0	0	6	0.08	0.12	6	0	0	0.11
4	6	0.08	0.09	6	0	0	6	0.08	0.10	6	0	0	0.11
5	6	0.07	0.08	6	0	0	6	0.07	0.08	6	0	0	0.11
6	6	0.07	0.09	6	0	0	6	0.06	0.08	6	0	0	0.11
7	6	0.06	0.10	6	0	0	6	0.07	0.11	6	0	0	0.09
8	6	0.07	0.10	6	0	0	6	0.07	0.12	6	0	0	0.20
9	6	0.08	0.11	6	0	0	6	0.07	0.13	6	0	0	0.14
10	6	0.07	0.10	6	0	0	6	0.07	0.11	6	0	0	0.11
11	6	0.08	0.10	6	0	0	6	0.07	0.10	6	0	0	0.08
12	6	0.06	0.10	6	0	0	6	0.08	0.17	6	0	0	0.08
13	6	0.08	0.14	6	0	0	6	0.07	0.11	6	0	0	0.08
14	6	0.07	0.09	6	0	0	6	0.07	0.08	6	0	0	0.08
15	6	0.06	0.08	6	0	0	6	0.07	0.10	6	0	0	0.08
16	6	0.06	0.08	6	0	0	6	0.06	0.09	6	0	0	0.08
17	6	0.07	0.10	6	0	0	6	0.05	0.07	6	0	0	0.08
18	6	0.06	0.07	6	0	0	6	0.05	0.06	6	0	0	0.08
19	6	0.06	0.07	6	0	0	6	0.06	0.08	6	0	0	0.08
20	6	0.06	0.09	6	0	0	6	0.06	0.09	6	0	0	0.08
21	6	0.11	0.10	6	0	0	6	0.08	0.15	6	0	0	0.08
22	6	0.09	0.10	6	0	0	6	0.07	0.09	6	0	0	0.08
23	6	0.09	0.10	6	0	0	6	0.09	0.09	6	0	0	0.08
24	6	0.09	0.10	6	0	0	6	0.09	0.09	6	0	0	0.08
25	6	0.09	0.10	6	0	0	6	0.09	0.11	6	0	0	0.08
26	6	0.08	0.10	6	0	0	6	0.07	0.09	6	0	0	0.08
27	6	0.07	0.10	6	0	0	6	0.08	0.10	6	0	0	0.08
28	6	0.09	0.11	6	0	0	6	0.08	0.09	6	0	0	0.08
29	6	0.08	0.09	6	0	0	6	0.07	0.09	6	0	0	0.08
30	6	0.08	0.11	6	0	0	6	0.08	0.09	6	0	0	0.08
31	6	0.08	0.09	6	0	0	6	0.08	0.10	6	0	0	0.08
Avg.	6	0.07	0.10	6	0	0	6	0.07	0.10	6	0	0	
Max.	6	0.11	0.14	6	0	0	6	0.09	0.17	6	0	0	0.21
Min.	6	0.06	0.07	6	0	0	6	0.05	0.06	6	0	0	

Fluoridation &
ChlorinationCity of Flint Water Treatment Plant
WSSN: 2310

July 2014

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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	0.00	0.15	0.14		4.1	3.3	7.4	0.7	1.0	1.3	1.7	1.3	1.6
2	0.04	0.15	0.56	0.15	4.0	4.0	8.0	0.9	1.1	2.5	3.2	1.9	2.2
3	0.04	0.19	0.54		3.9	4.1	8.0	0.5	0.6	3.2	3.5	1.8	1.9
4	0.04	0.19	0.56		3.8	4.1	7.9	0.5	0.8	1.9	2.4	1.4	1.7
5	0.04	0.17	0.59		3.7	4.5	8.2	0.6	0.8	2.0	2.5	1.5	1.7
6	0.30	0.17	0.58		3.5	4.6	8.1	0.6	0.9	2.0	2.4	1.7	1.9
7	0.40	0.17	0.61		3.9	5.2	9.1	0.8	1.2	2.4	3.0	1.8	2.3
8	0.50	0.15	0.64		3.6	4.7	8.3	0.5	0.7	2.9	3.5	2.1	2.3
9	0.40	0.17	0.64		3.3	4.8	8.1	0.2	0.6	2.8	3.2	1.9	2.2
10	0.50	0.17	0.73		3.4	4.6	8.0	0.6	1.0	2.7	3.5	1.5	2.0
11	0.30	0.20	0.59	0.65	2.9	4.3	7.2	0.3	0.7	1.9	2.6	1.5	1.9
12	0.40	0.15	0.66		2.8	4.3	7.1	0.3	0.6	2.0	2.4	1.5	1.9
13	0.40	0.19	0.68		2.8	4.3	7.1	0.4	0.6	1.9	2.3	1.6	1.8
14	0.40	0.20	0.72		4.3	5.1	9.4	0.7	1.0	2.1	2.6	1.9	2.2
15	0.40	0.19	0.70		4.6	4.2	8.8	0.7	1.0	2.5	3.0	2.2	2.5
16	0.40	0.19	0.71	0.66	4.3	3.6	7.9	0.7	0.9	2.2	2.7	1.9	2.2
17	0.40	0.19	0.69		4.1	3.7	7.8	0.5	0.7	2.8	3.2	1.9	2.2
18	0.40	0.22	0.65		4.5	3.6	8.1	0.8	1.1	2.5	3.0	1.9	2.3
19	0.40	0.17	0.67		4.4	3.1	7.5	0.8	1.1	2.4	2.8	1.8	2.0
20	0.40	0.21	0.66		4.3	3.1	7.4	0.7	1.0	2.5	2.9	1.8	2.1
21	0.50	0.18	0.75		4.0	2.7	6.7	0.8	1.1	2.4	2.8	1.7	2.0
22	0.40	0.19	0.65		3.4	3.4	6.8	0.6	0.8	1.8	2.2	1.4	1.7
23	0.40	0.19	0.59	0.66	3.5	4.2	7.7	0.8	1.0	2.3	2.9	1.9	2.2
24	0.40	0.19	0.64		3.6	4.1	7.7	0.6	0.8	2.2	2.8	2.1	2.6
25	0.40	0.21	0.62		4.1	4.2	8.3	0.5	0.7	2.4	2.8	1.9	2.2
26	0.60	0.21	0.88		5.3	2.7	8.0	1.4	1.7	2.5	3.1	1.9	2.3
27	0.50	0.17	0.79		4.6	2.6	7.2	0.9	1.2	2.7	3.1	1.7	1.9
28	0.50	0.19	0.72		4.7	2.7	7.4	0.9	1.1	2.1	2.6	1.6	1.8
29	0.50	0.19	0.70		4.8	2.6	7.4	1.1	1.3	2.2	2.6	1.7	2.0
30	0.50	0.19	0.28	0.62	4.5	2.7	7.2	1.1	1.5	2.2	2.6	1.8	2.1
31	0.50	0.18	0.61		3.2	3.9	7.1	0.5	0.8	2.1	2.4	1.7	2.0
Avg.	0.37	0.18	0.63	0.55	3.9	3.8	7.8	0.7	0.9	2.3	2.8	1.8	2.1
Max.	0.60	0.22	0.88	0.66	5.3	5.2	9.4	1.4	1.7	3.2	3.5	2.2	2.6
Min.	0.00	0.15	0.14	0.15	2.8	2.6	6.7	0.2	0.6	1.3	1.7	1.3	1.6

Chemical Analyses

City of Flint Water Treatment Plant
WSSN: 2310

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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	8.04	7.81	260	158	214	58	46	100	88.2	55.4	9.7	5.3	43	88
2	8.08	7.59	258	150	24	54	234	96	89.8	50.5	8.3	5.8	45	90
3	8.25	7.51	260	176	224	54	36	122	93.0	63.3	8.6	4.4	44	87
4	8.21	7.67	273	190	222	84	51	106	81.0	64.1	15.6	5.8	45	87
5	8.23	7.66	272	193	226	75	46	118	88.2	65.7	13.1	7.3	45	91
6	8.24	7.62	273	171	225	71	48	100	85.8	57.7	14.6	4.9	45	91
7	8.17	7.43	241	173	204	43	37	130	81.8	60.9	5.8	5.1	45	89
8	8.27	7.49	247	179	209	35	38	144	95.4	68.1	5.3	4.4	45	101
9	8.11	7.49	246	164	208	64	38	100	85.0	60.1	8.3	3.4	46	96
10	7.92	7.35	232	150	187	31	45	119	69.7	48.9	13.6	7.8	41	98
11	7.96	7.63	227	160	182	52	45	108	81.8	56.9	5.8	4.4	43	85
12	7.68	7.85	248	190	198	85	50	105	77.0	60.9	11.2	8.3	41	88
13	7.89	7.69	242	180	201	81	41	99	83.4	59.3	8.3	7.8	42	87
14	8.16	7.61	262	175	225	63	37	112	85.0	65.7	12.6	5.3	46	89
15	8.14	7.56	254	172	223	60	31	112	65.7	56.9	22.8	8.3	45	88
16	8.16	7.58	253	152	211	38	42	114	93.0	52.9	5.8	3.9	44	83
17	8.17	7.41	251	169	212	59	39	110	89.0	59.3	8.3	3.4	43	84
18	8.14	7.61	251	151	204	40	47	111	88.2	57.7	7.0	2.0	40	82
19	8.30	7.74	251	157	202	44	49	113	90.6	58.5	6.3	2.4	39	82
20	8.51	7.62	254	147	195	45	59	102	88.2	49.7	8.7	2.6	41	78
21	8.28	7.60	243	154	203	59	40	95	80.2	54.5	10.7	4.4	42	81
22	8.24	7.54	246	162	198	62	48	100	89.0	58.5	6.3	3.4	42	71
23	8.00	7.78	244	162	198	80	46	82	84.2	53.7	7.8	5.3	39	68
24	7.87	7.75	241	175	199	74	42	101	90.6	61.7	3.9	4.4	40	74
25	7.92	7.88	242	169	198	68	44	101	85.8	60.9	7.3	4.9	40	71
26	8.31	7.94	241	178	199	73	42	105	89.0	63.3	4.9	6.3	42	79
27	8.25	7.60	241	183	199	80	42	103	92.2	62.5	8.3	5.8	45	83
28	8.13	7.56	237	176	200	77	37	99	57.7	57.7	7.3	7.3	82	82
29	8.09	7.55	243	181	198	80	45	101	89.8	67.3	8.7	2.0	41	79
30	8.11	7.47	236	172	200	76	36	96	89.9	67.3	2.9	1.0	42	73
31	8.19	7.68	240	166	194	68	46	98	90.6	64.1	3.9	2.4	41	76
Avg.	8.13	7.62	249	169	199	62	49	107	85.1	59.5	8.8	4.8	44	84
Max.	8.51	7.94	273	193	226	85	234	144	95.4	68.1	22.8	8.3	82	101
Min.	7.68	7.35	227	147	24	31	31	82	57.7	48.9	2.9	1	39	68

207 4vc
62-400

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
WSSN: 2310

July 2014

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Date	Total Coliform						Standard Plate Count (Simplate MPN)		Conducti- vity (mS)	Temp. C	Color		Odor	
	Raw (Colilert MPN)		Filter Confluence (N&S)		Plant Tap									
	# Samples	Count	# Samples	# pos	# Samples	# pos	Raw	Tap			Raw	Raw	Tap	Raw
1	1	39726	12	0	1	0	10140	< 2	0.50	25.4				
2	1	5510	12	0	1	0	1940	< 2	0.50	25.2				
3	1	4764	12	0	1	0	1600	< 2	0.60	25.4				
4	1	4564	12	0	1	0	8280	< 2	0.60	25.4				
5	1	3316	12	0	1	0	7440	< 2	0.60	24.3				
6	1	2752	12	0	1	0	3540	< 2	0.50	26.1				
7	1	14540	12	0	1	0	2080	< 2	0.60	24.6				
8	1	4962	12	0	1	0	2480	< 2	0.60	24.8				
9	1	9222	12	0	1	0	14760	< 2	0.50	24.3				
10	1	15402	12	0	1	0	14760	< 2	0.50	23.8				
11	1	3130	12	1	1	0	4460	2	0.50	24.0				
12	1	3700	12	1	1	0	4620	< 2	0.60	24.0				
13	1	6152	12	0	1	0	7440	< 2	0.60	24.4				
14	1	5446	12	0	1	0	3780	< 2	0.42	24.6				
15	1	7746	12	0	1	0	5980	< 2	0.50	24.6				
16	1	5226	12	0	1	0	14760	< 2	0.50	24.0				
17	1	6152	12	0	1	0	2160	< 2	0.50	23.7				
18	1	3578	12	0	1	0	7440	< 2	0.50	23.0				
19	1	5206	12	0	1	0	2640	< 2	0.50	23.2				
20	1	4764	12	0	1	0	7100	< 2	0.50	24.3				
21	1	4978	12	0	1	0	1180	< 2	0.42	23.9				
22	1	3316	12	0	1	0	14760	< 2	0.50	24.5				
23	1	1866	12	0	1	0	14760	< 2	0.50	25.0				
24	1	10950	12	0	1	0	10140	< 2	0.50	24.5				
25	1	48329	12	0	1	0	14760	< 2	0.50	24.8				
26	1	4620	12	0	1	0	6780	< 2	0.50	25.3				
27	1	5510	12	0	1	0	7100	< 2	0.60	24.2				
28	1	16328	12	0	1	0	4460	< 2	0.47	23.3				
29	1	15402	12	0	1	0	4180	< 2	0.50	23.6				
30	1	7746	12	0	1	0	4620	< 2	0.50	22.7				
31	1	5818	12	0	1	0	14760	< 2	0.50	22.4				
Avg.									0.52	24.3				
Max.							14760	2	0.60	26.1				
Min.									0.42	22.4				

**Distribution System
Monitoring**

 City of Flint Water Treatment Plant
WSSN: 2310

July 2014

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Date	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l										Number of Samples
	1	2	3	4	5	6	7	8	CS	WR	
1									0.6	0.5	2
2	1.0	1.3	0.5	0.5	0.3	0.9	0.4	1.4	0.2	1.4	10
3	0.9	1.4	0.8	0.8	0.1	1.2	0.3	1.6			8
4											0
5											0
6											0
7									0.9	1.5	2
8									3.0	1.8	2
9	1.4	1.6	1.1	1.2	0.4	1.2	0.8	1.1	0.9	1.0	10
10	1.3	1.5	1.1	1.4	0.8	1.1	0.9	1.7	1.0	1.0	10
11									0.9	1.1	2
12											0
13											0
14									0.5	1.1	2
15	1.1	1.3	0.9	1.1	0.3	0.6	0.5	1.5	1.0	0.2	10
16	0.8	1.1	0.7	0.1	0.1	0.9	0.4	1.6	0.1	0.5	10
17	0.8	1.3	0.6	0.2	0.2	0.9	0.4	1.5	0.1	0.9	10
18									0.3	0.1	2
19											0
20											0
21									0.3	0.1	2
22									0.1	1.1	2
23	0.8	1.3	0.8	0.9	0.1	0.7	0.3	1.6	0.8	0.1	10
24	0.8	0.6	0.7	0.8	0.1	0.8	0.3	1.3	1.3	0.0	10
25									0.5	1.2	2
26											0
27											0
28									0.5	0.0	2
29	0.2	1.1	0.4	0.7	0.1	0.6	0.2	1.3	0.3	1.0	10
30	0.5	0.8	0.5	0.3	0.0	0.3	0.2	1.2	0.1	0.0	10
31											0

Distribution Sample Summary

Total # of routine distribution samples analyzed	128
Total # of routine distribution samples required	100

Distribution Disinfectant Free Residual Summary

Percent samples with a detectable disinfectant residual	98%
Average disinfectant residual this month	0.8

Distribution Bacteriological Summary

Total # of positive routine distribution samples	2
Percent of routine distribution samples positive	2%

Positive Distribution Samples

Date	Monitoring Station	Date	Repeat Monitoring Stations	Residual	Positive or Negative
7/22/2014	Cedar Street Reservoir	7/23/2014	Cedar Street Reservoir	0.8 / 1.2	Negative
	1100 Cedar St.	7/23/2014	1035 Ann Arbor St.	0.4 / 0.7	Negative
		7/23/2014	705 W. 12th St.	0.1 / 0.3	Negative
7/30/2014	University Market	7/31/2014	University Market	0.1 / 0.3	Negative
	2501 Flushing Rd.	7/31/2014	1117 N. Chevrolet	0.0 / 0.1	Negative
		7/31/2014	1128 N. Chevrolet	0.0 / 0.1	Negative

Date	Total Chlorine Residual at Bacteriological Monitoring Stations mg/l										
	1	2	3	4	5	6	7	8	CS	WR	Number of Samples
1									0.9	0.8	2
2	1.3	1.7	0.8	0.8	0.6	1.3	0.6	1.6	0.3	0.8	10
3	1.1	1.7	1.0	1.2	0.3	1.8	0.5	2.0			8
4											0
5											0
6											0
7									1.1	1.8	2
8									3.4	2.2	2
9	1.6	1.9	1.4	1.6	0.7	1.8	1.0	1.4	1.2	1.3	10
10	1.7	2.0	1.4	1.6	1.1	1.5	1.1	2.0	1.5	1.3	10
11									1.1	1.3	2
12											0
13											0
14									0.8	1.4	2
15	1.5	1.7	1.3	1.4	0.5	1.0	0.7	1.8	1.5	0.3	10
16	1.1	1.4	1.2	0.3	0.2	1.3	0.8	1.6	0.3	0.7	10
17	0.9	1.6	0.9	0.3	0.3	1.3	0.6	1.8	0.3	1.3	10
18									0.4	0.2	2
19											0
20											0
21									0.5	0.3	2
22									0.2	1.4	2
23	1.0	1.6	0.9	1.1	0.1	0.9	0.5	2.0	1.2	0.2	10
24	1.2	1.1	1.1	1.0	0.2	1.2	0.6	1.8	1.7	0.1	10
25									0.7	1.6	2
26											0
27											0
28									0.7	0.2	2
29	0.4	1.4	0.6	1.0	0.3	0.8	0.8	1.6	0.5	1.3	10
30	0.7	1.1	0.7	0.6	0.1	0.4	0.2	1.4	0.1	0.1	10
31											0

Distribution Disinfectant Total Residual Summary	
Percent samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	1.0

CITY of FLINT WATER TREATMENT PLANT MONTHLY OPERATION REPORT

SUPPLY NAME: CITY of FLINT WATER PLANT
 WSSN: 2310

Michael Glasgow

Operator-in-Charge

June 2014

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>25</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>74</u>	Hours
Average Head Loss:	<u>*</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>3.5</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>3.6%</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>24000</u> lb.	Est. supply:	<u>20</u> days
Primary Coagulant (Ferric Chloride) on hand:	<u>63450</u> lb.	Est. supply:	<u>10</u> days
Lime (CaO) on hand:	<u>169</u> tons	Est. supply:	<u>18</u> days
Fluoride on Hand:	<u>9064</u> lb.	Est. supply:	<u>16</u> days
Cost of All Chemicals per Million Gallons:	<u>*</u> dollars		
Total Power Cost per Million Gallons:	<u>*</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>180</u>	<u>180</u>
Percent of filter confluence samples > 0.3 NTU:	<u>0.00%</u>	<u>0.00%</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.		

COMPLETED

[illegible]

Filter turbidity

City of Flint Water Treatment Plant
WSSN: 2310

June 2014

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Date	Turbidity, Units												
	Confluence Point. No.1 (N) North						Confluence Point. No.2 (S) South						Point of Entry
	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	Plant Tap NTU
1	6	0.09	0.12	6	0	0	6	0.09	0.11	6	0	0	0.07
2	6	0.11	0.16	6	0	0	6	0.10	0.14	6	0	0	0.09
3	6	0.14	0.23	6	0	0	6	0.12	0.19	6	0	0	0.11
4	6	0.14	0.19	6	0	0	6	0.09	0.11	6	0	0	0.10
5	6	0.18	0.24	6	0	0	6	0.15	0.22	6	0	0	0.15
6	6	0.13	0.15	6	0	0	6	0.12	0.16	6	0	0	0.12
7	6	0.14	0.18	6	0	0	6	0.12	0.14	6	0	0	0.12
8	6	0.12	0.20	6	0	0	6	0.15	0.20	6	0	0	0.12
9	6	0.15	0.25	6	0	0	6	0.14	0.22	6	0	0	0.11
10	6	0.21	0.26	6	0	0	6	0.14	0.23	6	0	0	0.14
11	6	0.11	0.16	6	0	0	6	0.12	0.23	6	0	0	0.16
12	6	0.11	0.13	6	0	0	6	0.10	0.13	6	0	0	0.09
13	6	0.09	0.12	6	0	0	6	0.09	0.11	6	0	0	0.08
14	6	0.11	0.13	6	0	0	6	0.09	0.12	6	0	0	0.10
15	6	0.11	0.18	6	0	0	6	0.10	0.15	6	0	0	0.10
16	6	0.11	0.14	6	0	0	6	0.09	0.10	6	0	0	0.09
17	6	0.09	0.13	6	0	0	6	0.07	0.13	6	0	0	0.07
18	6	0.09	0.13	6	0	0	6	0.08	0.20	6	0	0	0.08
19	6	0.08	0.14	6	0	0	6	0.09	0.17	6	0	0	0.08
20	6	0.08	0.10	6	0	0	6	0.07	0.09	6	0	0	0.16
21	6	0.07	0.08	6	0	0	6	0.08	0.20	6	0	0	0.08
22	6	0.08	0.11	6	0	0	6	0.09	0.12	6	0	0	0.08
23	6	0.08	0.10	6	0	0	6	0.08	0.11	6	0	0	0.07
24	6	0.09	0.14	6	0	0	6	0.10	0.26	6	0	0	0.13
25	6	0.07	0.14	6	0	0	6	0.08	0.19	6	0	0	0.09
26	6	0.08	0.10	6	0	0	6	0.08	0.10	6	0	0	0.09
27	6	0.09	0.11	6	0	0	6	0.08	0.10	6	0	0	0.09
28	6	0.08	0.10	6	0	0	6	0.09	0.10	6	0	0	0.10
29	6	0.10	0.14	6	0	0	6	0.09	0.12	6	0	0	0.11
30	6	0.10	0.11	6	0	0	6	0.09	0.14	6	0	0	0.15
Avg.	6	0.11	0.15	6	0	0	6	0.10	0.15	6	0	0	
Max.	6	0.21	0.26	6	0	0	6	0.15	0.26	6	0	0	0.16
Min.	6	0.07	0.08	6	0	0	6	0.07	0.09	6	0	0	

**Fluoridation &
Chlorination**

 City of Flint Water Treatment Plant
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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	0.00	0.15	0.17		4.8	1.5	6.3	1.3	1.6	1.5	2.0	1.2	1.7
2	0.00	0.16	0.17		4.7	1.7	6.4	1.1	1.5	1.6	2.0	1.3	1.5
3	0.00	0.16	0.16		5.4	1.8	7.2	1.0	1.5	1.5	2.0	1.3	1.7
4	0.50	0.18	0.20		5.3	2.0	7.3	1.4	1.8	1.8	2.1	1.7	2.0
5	0.50	0.14	0.45	0.25	4.5	2.0	6.5	0.9	1.2	1.6	1.9	1.3	1.7
6	0.00	0.15	0.16		4.7	2.4	7.1	0.7	1.0	1.6	1.9	1.4	1.7
7	0.00	0.14	0.18		5.5	2.8	8.3	0.7	1.0	1.6	2.0	1.3	1.6
8	0.00	0.17	0.19		5.2	2.7	7.9	0.7	0.9	1.5	1.9	1.3	1.7
9	0.00	0.17	0.18		5.1	2.7	7.8	0.5	0.9	1.7	2.1	1.3	1.8
10	0.00	0.16	0.18		4.8	2.5	7.3	0.3	0.6	1.4	1.8	1.2	1.6
11	0.00	0.17	0.14		4.8	3.1	7.9	0.9	1.2	1.7	2.2	1.6	1.9
12	0.00	0.14	0.13	0.18	4.2	2.9	7.1	0.8	1.2	2.0	2.4	1.9	2.3
13	0.00	0.16	0.14		4.4	3.4	7.8	0.6	0.8	2.4	2.8	2.1	2.4
14	0.00	0.16	0.14		4.2	3.5	7.7	0.7	1.0	2.4	2.8	2.0	2.4
15	0.00	0.16	0.13		4.1	3.5	7.6	0.4	0.8	2.3	2.9	1.7	2.0
16	0.00	0.16	0.13		4.2	3.5	7.7	0.8	1.0	2.6	3.1	2.1	2.5
17	0.00	0.15	0.13		4.6	3.1	7.7	1.1	1.5	2.5	2.9	2.2	2.5
18	0.00	0.16	0.13		5.0	2.6	7.6	1.3	1.5	2.5	3.0	2.0	2.5
19	0.00	0.14	0.13	0.18	5.0	2.9	7.9	1.4	1.6	2.7	3.1	2.1	2.4
20	0.00	0.16	0.13		5.0	3.1	8.1	1.3	1.5	2.3	2.8	1.7	2.1
21	0.00	0.16	0.13		5.0	4.0	9.0	1.1	1.4	2.3	2.8	2.0	2.2
22	0.00	0.17	0.13		4.9	4.0	8.9	0.8	1.0	2.4	3.0	2.1	2.4
23	0.00	0.16	0.13		4.7	2.6	7.3	1.4	1.7	2.5	2.8	2.2	2.7
24	0.00	0.16	0.13		4.8	2.9	7.7	1.3	1.5	2.5	2.9	2.7	3.0
25	0.00	0.16	0.13		4.7	2.9	7.6	1.2	1.5	2.5	2.9	2.0	2.4
26	0.00	0.17	0.12	0.15	3.9	3.0	6.9	1.0	1.4	2.2	2.6	2.5	3.0
27	0.00	0.16	0.13		4.9	2.7	7.6	1.2	1.5	2.9	3.2	2.1	2.5
28	0.00	0.16	0.14		4.6	3.0	7.6	1.5	1.8	2.3	3.0	2.4	3.0
29	0.00	0.15	0.14		3.8	3.5	7.3	0.8	1.2	2.3	2.8	1.9	2.3
30	0.00	0.15	0.13		4.1	3.2	7.3	0.6	0.9	2.5	3.3	1.8	2.1
Avg.	0.03	0.16	0.16	0.19	4.7	2.9	7.5	1.0	1.3	2.1	2.6	1.8	2.2
Max.	0.50	0.18	0.45	0.25	5.5	4.0	9.0	1.5	1.8	2.9	3.3	2.7	3.0
Min.	0.00	0.14	0.12	0.15	3.8	1.5	6.3	0.3	0.6	1.4	1.8	1.2	1.5

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	8.28	7.81	270	234	216	132	54	102	85.8	84.2	13.6	5.8	41	87
2	8.02	7.58	262	236	218	132	44	104	84.2	82.6	12.6	7.3	40	83
3	8.17	7.39	278	248	218	140	60	108	93.0	77.8	6.3	13.1	43	75
4	8.25	7.49	276	238	220	144	56	94	80.2	79.4	18.5	9.2	41	79
5	8.26	7.49	274	236	220	148	54	88	89.0	79.4	12.6	9.2	44	80
6	8.16	7.52	262	234	216	146	46	88	85.0	77.0	12.2	10.2	43	93
7	8.21	7.27	268	260	226	172	42	88	87.4	85.0	12.2	11.7	42	80
8	8.26	7.36	260	262	222	170	38	92	81.0	82.6	13.6	12.2	43	80
9	8.17	7.36	268	266	220	164	48	102	93.0	85.8	8.3	10.2	44	79
10	8.18	7.21	270	260	226	172	44	88	96.2	94.6	4.9	5.8	45	78
11	8.10	7.38	266	192	220	100	46	92	83.4	64.1	14.1	7.8	43	86
12	8.11	7.44	268	192	222	100	46	92	84.2	64.1	14.1	7.8	42	80
13	8.01	7.56	264	218	218	110	46	108	85.8	70.5	12.2	10.2	42	81
14	7.94	7.65	272	210	216	114	56	96	90.6	68.1	11.2	9.7	40	78
15	8.27	7.57	268	188	226	100	42	88	85.8	67.3	13.1	4.9	43	79
16	8.34	7.75	266	186	220	94	46	92	84.2	64.9	13.1	5.8	44	80
17	8.12	7.66	262	190	222	92	40	98	90.6	68.9	7.3	4.4	43	80
18	8.24	7.24	268	184	230	94	38	90	87.4	66.5	12.2	3.4	40	81
19	8.13	7.61	272	182	228	88	44	94	91.4	62.5	8.3	6.3	42	81
20	8.01	7.33	264	180	222	88	42	92	89.0	60.9	10.2	8.7	42	83
21	7.98	7.35	252	182	226	82	26	100	86.6	64.1	9.0	5.3	43	84
22	8.00	7.45	264	180	224	84	40	96	87.4	59.3	11.2	7.8	42	81
23	7.98	7.00	260	168	224	74	36	94	89.8	53.7	8.7	8.3	46	88
24	7.92	7.60	274	194	222	82	52	112	89.0	60.9	10.7	10.2	45	87
25	7.98	7.68	276	168	228	70	48	98	91.4	58.5	11.7	5.3	43	90
26	7.88	7.72	280	186	226	80	54	106	86.6	65.7	15.6	5.3	46	90
27	7.92	7.12	254	176	224	66	30	110	89.8	67.3	7.3	1.9	39	92
28	7.97	7.64	272	176	230	74	42	102	85.0	64.1	14.6	3.9	43	85
29	8.26	7.49	276	178	232	76	44	102	87.4	55.3	12.2	9.7	40	90
30	7.94	7.70	268	156	230	66	38	90	92.2	56.9	9.2	3.4	44	91
Avg.	8.10	7.48	268	205	223	108	45	97	87.7	69.7	11.4	7.5	43	83
Max.	8.34	7.81	280	266	232	172	60	112	96.2	94.6	18.5	13.1	46	93
Min.	7.88	7.00	252	156	216	66	26	88	80.2	53.7	4.9	1.94	39	75

**Bacteriological &
Physical Parameters**

 City of Flint Water Treatment Plant
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Date	Total Coliform						Standard Plate Count (Simplate MPN)		Wind Direction	Temp. C	Color		Odor	
	Raw (Colilert MPN)		Filter Confluence (N&S)		Plant Tap									
	# Samples	Count	# Samples	# pos	# Samples	# pos	Raw	Tap		Raw	Raw	Tap	Raw	Tap
1	1	320	12	1	1	0	3020	<2		21.7				
2	1	62	12	0	1	0	7840	<2		20.5				
3	1	1710	12	0	1	0	4180	<2		22.4				
4	1	3232	12	0	1	0	5980	<2		22.1				
5	1	3232	12	0	1	0	1368	<2		21.5				
6	1	4286	12	2	1	0	1540	<2		22.2				
7	1	4374	12	0	1	0	11100	<2		22.5				
8	1	3328	12	0	1	0	7840	<2		21.7				
9	1	1768	12	0	1	0	9400	<2		21.5				
10	1	6152	12	0	1	0	11100	<2		23.9				
11	1	12262	12	0	1	0	3660	<2		23.4				
12	1	8704	12	0	1	0	12460	<2		22.9				
13	1	4978	12	0	1	0	1720	<2		22.3				
14	1	4092	12	0	1	0	1240	<2		20.9				
15	1	3912	12	0	1	0	1660	<2		21.7				
16	1	3440	12	0	1	0	1940	<2		22.7				
17	1	2748	12	0	1	0	1600	<2		23.3				
18	1	2338	12	0	1	0	2080	<2		23.3				
19	1	1542	12	0	1	0	7840	<2		22.8				
20	1	1678	12	0	1	0	1180	<2		22.4				
21	1	1672	12	0	1	0	960	<2		21.8				
22	1	7308	12	0	1	0	7440	<2		22.0				
23	1	4028	12	0	1	0	3900	<2		21.6				
24	1	1234	12	0	1	0	3780	<2		22.5				
25	1	2100	12	0	1	0	2240	<2		22.5				
26	1	2396	12	0	1	0	5140	<2		22.0				
27	1	1968	12	0	1	0	2000	<2		22.9				
28	1	1976	12	0	1	0	11100	<2		22.9				
29	1	2802	12	0	1	0	6780	<2		25.8				
30	1	9572	12	0	1	0	2560	<2		24.8				
Avg.										22.5				
Max.							12460	0		25.8				
Min.										20.5				

**Distribution System
Monitoring**

 City of Flint Water Treatment Plant
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Date	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l										
	1	2	3	4	5	6	7	8	CS	WR	Number of Samples
1											0
2									0.5	0.0	2
3									0.2	0.0	2
4	0.5	0.9	0.5	0.5	0.2	0.5	0.4	0.9	0.2	0.0	10
5	0.4	0.2	0.5	0.4	0.1	0.6	0.3	0.9	0.1	0.0	10
6									0.1	0.0	2
7											0
8											0
9									0.1	0.0	2
10	0.6	1.1	0.4	0.6	0.2	0.6	0.3	0.7	0.3	0.0	10
11									0.0	0.0	2
12	1.2	1.8	0.9	1.3	0.6	0.9	0.5	1.8	1.4	0.0	10
13									0.1	0.0	2
14											0
15											0
16									1.2	0.0	2
17	1.3	1.5	1.0	0.5	0.7	1.5	0.9	2.0	0.2	0.3	10
18	1.4	1.1	1.2	1.1	0.3	1.2	0.9	1.4	0.6	0.1	10
19									0.2	0.1	2
20											0
21											0
22											0
23											0
24											0
25	1.3	1.3	1.1	1.0	0.3	0.8	1.0	1.5	0.9	0.4	10
26	1.1	1.4	0.9	0.0	0.0	1.4	0.8	2.1	0.9	0.6	10
27									0.7	1.1	2
28											0
29											0
30									0.6	1.3	2

Distribution Sample Summary

Total # of routine distribution samples analyzed	100
Total # of routine distribution samples required	100

Distribution Disinfectant Free Residual Summary

Percent samples with a detectable disinfectant residual	86%
Average disinfectant residual this month	0.7

Distribution Bacteriological Summary

Total # of positive routine distribution samples	2
Percent of routine distribution samples positive	2%

Positive Distribution Samples

Date	Monitoring Station	Date	Repeat Monitoring Stations	Residual	Positive or Negative
6/10/2014	WEST SIDE	6/11/2014	WS UPSTREAM	10/30	ABSENT
		6/11/2014	WS DOWNSTREAM	10/30	ABSENT
		6/11/2014	WEST SIDE	0/10	ABSENT
6/11/2014	CEDAR STREET	6/12/2014	CS UPSTREAM	0.2/0.4	ABSENT
		6/12/2014	CS DOWNSTREAM	0.2/0.3	ABSENT
		6/12/2014	CEDAR STREET	1.4/1.8	ABSENT

**Distribution System
Monitoring**

 City of Flint Water Treatment Plant
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June 2014

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Date	Total Chlorine Residual at Bacteriological Monitoring Stations mg/l										Number of Samples
	1	2	3	4	5	6	7	8	CS	WR	
1											0
2									0.8	0.2	2
3									0.3	0.2	2
4	1.0	1.3	0.8	0.9	0.3	1.0	0.6	1.1	0.3	0.2	10
5	0.8	0.6	0.8	0.6	0.3	0.8	0.6	1.1	0.3	0.2	10
6									0.3	0.2	2
7											0
8											0
9									0.2	0.2	2
10	1.0	1.6	0.7	1.1	0.6	1.2	0.7	1.2	0.5	0.2	10
11									0.2	0.1	2
12	1.7	2.5	1.3	1.7	0.9	1.2	0.9	2.3	1.8	0.1	10
13									0.3	0.2	2
14											0
15											0
16									1.6	0.2	2
17	1.9	1.9	1.3	0.7	1.0	2.0	1.3	2.9	0.3	0.5	10
18	2.0	1.5	1.8	1.5	0.6	1.6	1.4	2.1	0.9	0.3	10
19									0.3	0.3	2
20											0
21											0
22											0
23											0
24											0
25	1.8	1.9	1.6	1.4	0.5	1.1	1.4	2.0	1.1	0.7	10
26	1.5	1.9	1.3	0.1	0.1	1.8	1.1	2.5	1.1	0.8	10
27									1.0	1.5	2
28											0
29											0
30									0.9	1.3	2

Distribution Disinfectant Total Residual Summary	
Percent samples with a detectable disinfectant residual	100%
Average disinfectant residual this month	1.0

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

SUPPLY NAME: CITY of FLINT WATER PLANT
WSSN: 2310

Michael Glasgow
Operator-in-Charge

May 2014
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>26.9</u>	Million Gallons per Day
Rated Plant Capacity:	<u>36</u>	Million Gallons per Day
Average Filter Run:	<u>101</u>	Hours
Average Head Loss:	<u>*</u>	Feet
Average Filtration Rate:	<u>2.6</u>	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	<u>3.8</u>	Gallons Per Square Feet per Minute
Average Wash Water Use:	<u>2</u>	Percent of Treated Water

Chemical Data

Chlorine on hand:	<u>22000</u> lb.	Est. supply:	<u>20</u> days
Primary Coagulant (Ferric Chloride) on hand:	<u>83765</u> lb.	Est. supply:	<u>14</u> days
Cost of All Chemicals per Million Gallons:	<u>*</u> dollars		
Total Power Cost per Million Gallons:	<u>*</u> dollars		

Remarks

Number of filter confluence samples > 0.3 NTU:
Number of filter confluence samples collected:
Percent of filter confluence samples > 0.3 NTU:
Number of filter confluence samples > 1 NTU

<u>3</u>
<u>350</u>
<u>0.86%</u>
<u>0</u>

Did any individual filter exceed:

1.0 NTU in two consecutive measurements taken 15 minutes apart?

NO

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?

NO

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?

NO

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?

NO

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?

YES

If yes, indicate date(s) and duration on a separate sheet.

Conc. on low rate

4 to 5 hrs and more - former not pay'd after raised flow

5 & 8 9 10 11 12

5 filters on line

Also 6 12 13 14 15 16 17 18 19 20 21 22 23 24

3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

of CFE
 samples per 4 HR sample period?

CAN we
 get turb
 off plates?

Very
 High!

COU
 get

start up
 issues
 min 500
 5000 but soft and
 only one side

Coagulation
ParametersCity of Flint Water Treatment Plant
WSSN: 2310

May 2014

Page 2

Date	Million Gallons Treated	Ferric as Fe ³⁺ mg/L	Turbidity, Units																	Point of Entry Plant Tap NTU
			Number of Samples	Raw		Applied	Number of Samples	Confluence Point, No.1 (N) North		Confluence Point, No.2 (S) South		Number of Samples	Confluence Point, No.2 (S) South		No. of Samples >0.3 NTU					
				Avg.	Max.	Applied Avg.		Avg.	Max	No. of 4 Hr. Compliance periods	No. of 4 Hr. Compliance periods >0.3 NTU		No. of Samples >0.3 NTU	Avg.		Max	No. of 4 Hr. Compliance periods	No. of 4 Hr. Compliance periods >0.3 NTU		
1	15.1	10.9	6	9.80	12.7	5.04	6	0.10	0.19	6	0	0	6	0.07	0.08	6	0	0	0.09	
2	14.7	11.3	6	10.1	10.7	7.12	6	0.06	0.07	6	0	0	6	0.07	0.10	6	0	0	0.09	
3	21.4	12.3	6	11.2	12.6	7.40	6	0.15	0.18	6	0	0	6	0.11	0.15	6	0	0	0.11	
4	21.4	11.8	6	26.2	31.2	8.65	6	0.11	0.13	6	0	0	6	0.10	0.11	6	0	0	0.12	
5	21.6	12.3	6	12.6	14.5	5.80	6	0.16	0.23	6	0	0	6	0.14	0.18	6	0	0	0.12	
6	22.3	12.1	6	15.0	20.3	4.53	6	0.21	0.27	6	0	0	6	0.18	0.21	6	0	0	0.19	
7	21.9	12.1	6	15.5	14.8	5.23	6	0.13	0.16	6	0	0	6	0.12	0.17	6	0	0	0.11	
8	22.7	11.7	6	12.6	15.5	4.74	6	0.16	0.25	6	0	0	6	0.11	0.13	6	0	0	0.16	
9	22.2	12.0	6	9.30	9.60	4.33	6	0.12	0.15	6	0	0	6	0.11	0.16	6	0	0	0.14	
10	21.8	12.2	6	13.2	15.3	5.60	6	0.11	0.18	6	0	0	6	0.09	0.10	6	0	0	0.09	
11	19.1	13.8	6	12.6	14.1	6.43	6	0.19	0.29	6	0	0	6	0.08	0.09	6	0	0	0.09	
12	8.5	15.3	2	12.0	13.9	8.46	1	0.09	0.09	1	0	0	1	0.07	0.07	1	0	0	0.08	
13	0.0	12.9	2	11.3	14.1	n/a	0	n/a	n/a	0	n/a	n/a	0	n/a	n/a	0	n/a	n/a	0.10	
14	22.2	12.3	6	30.8	71.7	11.8	6	0.24	0.37	6	1	1	6	0.23	0.31	6	1	1	0.16	
15	16.6	20.6	6	45.2	63.0	5.68	6	0.21	0.28	6	0	0	6	0.24	0.28	6	0	0	0.22	
16	20.2	18.7	6	28.2	37.3	5.21	6	0.21	0.38	6	1	1	6	0.22	0.45	6	1	1	0.22	
17	21.0	20.0	6	14.3	19.3	4.90	6	0.12	0.22	6	0	0	6	0.09	0.08	6	0	0	0.11	
18	20.8	18.3	6	9.50	10.7	6.03	6	0.14	0.28	6	0	0	6	0.08	0.09	6	0	0	0.09	
19	22.0	18.2	6	9.20	11.3	4.59	6	0.12	0.17	6	0	0	6	0.07	0.10	6	0	0	0.09	
20	22.1	18.0	6	7.20	8.40	4.63	6	0.11	0.11	6	0	0	6	0.09	0.11	6	0	0	0.09	
21	21.0	19.4	6	7.80	8.90	6.27	6	0.11	0.18	6	0	0	6	0.08	0.08	6	0	0	0.09	
22	21.0	18.6	6	9.40	11.3	6.50	6	0.11	0.16	6	0	0	6	0.07	0.09	6	0	0	0.08	
23	21.0	18.9	6	9.10	10.4	6.24	6	0.11	0.13	6	0	0	6	0.08	0.09	6	0	0	0.08	
24	20.8	17.9	6	7.10	8.30	5.38	6	0.12	0.18	6	0	0	6	0.08	0.09	6	0	0	0.09	
25	21.0	18.3	6	6.00	7.30	5.62	6	0.14	0.22	6	0	0	6	0.18	0.25	6	0	0	0.10	
26	22.0	18.0	6	5.20	5.60	3.23	6	0.12	0.14	6	0	0	6	0.10	0.13	6	0	0	0.11	
27	20.6	19.4	6	5.70	7.30	2.78	6	0.13	0.18	6	0	0	6	0.12	0.14	6	0	0	0.10	
28	20.1	20.0	6	4.20	5.30	3.52	6	0.11	0.13	6	0	0	6	0.08	0.08	6	0	0	0.08	
29	19.7	20.0	6	5.20	10.3	3.72	6	0.09	0.12	6	0	0	6	0.07	0.08	6	0	0	0.06	
30	19.3	16.1	6	3.50	5.30	3.54	6	0.11	0.16	6	0	0	6	0.07	0.07	6	0	0	0.06	
31	18.0	17.6	6	3.50	4.40	2.23	6	0.09	0.12	6	0	0	6	0.08	0.09	6	0	0	0.08	
Avg.	19.4	15.8	6	12.3		5.51	6	0.13	0.19	6	0	0	6	0.11	0.14	6	0	0		
Max.	22.7	20.6	6	45.2	71.7	11.8	6	0.24	0.38	6	1	1	6	0.24	0.45	6	1	1	0.22	
Min.	0.0	10.9	2	3.50		2.23	0	0.06	0.07	0	0	0	0	0.07	0.07	0	0	0		
Total	602.1																			

fees would be
 better

1500 g @ 2.5 gpm/ft²
 @ 3.0 to 4.0 ft/min = 1.75 gpm/ft²

inactive

can do
 would like one
 filter for back-up

210

using water
from DORT

when was on DWSO water

Fluoridation &
Chlorination

City of Flint Water Treatment Plant
WSSN: 2310

May 2014

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Date	Fluoride Applied as F- mg/L	Fluoride Analysis (mg/L)			Chlorine Application (mg/L)			Chlorine Residual (mg/L)					
		Raw	Tap	Dist.	Intermediate Chlorine	Post Chlorine	Total Chlorine	Filtered		3 MG Well		Tap	
								Free	Total	Free	Total	Free	Total
1	0	0.14	0.19		3.4	0.0	3.4	1.4	1.6	1.4	1.6	1.2	1.5
2	0	0.15	0.34		4.0	0.0	4.0	1.2	1.3	1.6	2.0	1.3	1.6
3	0	0.14	0.18		4.0	0.0	4.0	1.8	2.2	1.7	2.0	1.5	1.7
4	0	0.15	0.24		4.4	0.0	4.4	2.2	2.6	1.5	1.7	1.8	2.2
5	0	0.14	0.13		4.7	0.0	4.7	1.9	2.2	1.8	2.1	1.2	1.4
6	0	0.14	0.13		4.9	0.0	4.9	1.9	2.3	1.7	1.9	1.2	1.5
7	0	0.15	0.14		4.9	0.0	4.9	1.8	2.2	2.0	2.3	1.9	2.2
8	0	0.15	0.14	0.17	4.7	0.0	4.7	1.8	2.3	1.8	2.2	1.7	2.1
9	0	0.15	0.13		5.1	0.0	5.1	1.5	1.9	1.7	2.0	1.5	1.9
10	0	0.15	0.14		5.2	0.0	5.2	2.0	2.5	1.7	2.1	1.5	2.0
11	0	0.16	0.14		5.6	0.0	5.6	2.1	2.6	2.0	2.6	1.7	2.1
12	0	0.15	0.13		6.9	0.0	6.9	1.8	2.4	1.7	2.2	1.4	2.0
13	0	0.15	0.25		5.0	0.0	5.0	n/a	n/a	1.7	2.0	1.5	1.8
14	0	0.15	0.13	0.23	4.9	0.0	4.9	1.9	2.3	1.5	1.9	1.5	1.8
15	0	0.14	0.14		6.2	0.0	6.2	2.0	2.4	2.0	2.5	2.2	2.6
16	0	0.14	0.13		5.3	0.0	5.3	1.9	2.3	1.6	2.0	1.4	1.7
17	0	0.15	0.14		5.1	0.6	5.7	1.7	2.1	1.6	1.9	1.6	2.0
18	0	0.16	0.15		5.1	0.6	5.7	1.5	1.9	1.6	1.9	1.4	1.7
19	0	0.15	0.14		4.7	0.2	4.9	1.6	1.8	1.9	2.3	1.5	1.7
20	0	0.15	0.15		5.0	0.5	5.5	1.9	2.3	2.1	2.6	1.6	1.9
21	0	0.15	0.16		4.9	0.4	5.3	1.8	2.3	2.0	2.4	1.8	2.3
22	0	0.15	0.14		5.0	0.2	5.2	1.7	2.1	2.1	2.5	1.5	1.8
23	0	0.14	0.13		4.9	0.4	5.3	1.5	1.8	1.8	2.3	1.6	2.1
24	0	0.15	0.15		5.0	0.9	5.9	1.5	2.0	1.5	2.0	1.3	1.7
25	0	0.15	0.14		5.0	1.0	6.0	1.4	1.8	1.6	2.0	1.5	1.9
26	0	0.15	0.16		5.0	0.9	5.9	1.5	1.8	1.7	2.3	1.7	2.0
27	0	0.16	0.17		5.3	0.9	6.2	1.5	1.7	1.8	2.2	1.5	1.7
28	0	0.15	0.16	0.19	5.7	1.0	6.7	1.6	2.0	1.9	2.3	1.6	2.0
29	0	0.16	0.16		5.1	0.8	5.9	1.5	1.8	1.8	2.1	1.2	1.4
30	0	0.16	0.17		5.1	1.1	6.2	1.4	1.7	1.6	1.8	1.4	1.7
31	0	0.15	0.16		5.4	1.4	6.8	1.4	1.7	1.6	2.0	1.2	1.6
Avg.	0	0.15	0.16	0.20	5.0	0.4	5.4	1.7	2.1	1.7	2.1	1.5	1.9
Max.	0	0.16	0.34	0.23	6.9	1.4	6.9	2.2	2.6	2.1	2.6	2.2	2.6
Min.	0	0.14	0.13	0.17	3.4	0.0	3.4	1.2	1.3	1.4	1.6	1.2	1.4

inst. FL₂
started 3rd/4th
face line leak - shut down
main staff - plastic welded
needs to be repaired or
Antic - end of No. or soon
to repair hole or change out piping

2x indy duty
or
2x per shift

1/4 Hrs

Secur like softening
dropped off around 6th/7th

split treatment
due to
flow out
of city
was softening

45-46 mgd
4-5 mgd

Chemical Analyses

City of Flint Water Treatment Plant
WSSN: 2310

May 2014

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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	8.44	7.71	246	146	196	86	50	80	56.7	48.1	20.9	7.8	43.0	67.0
2	8.27	7.07	250	162	196	80	54	82	83.4	48.1	10.2	10.2	44.0	41.0
3	8.26	7.47	250	132	200	60	50	72	82.6	42.5	10.7	6.3	40.0	60.0
4	8.39	7.50	256	120	196	70	60	50	86.6	50.9	6.3	6.3	47.0	60.0
5	8.38	7.41	232	152	204	76	28	76	78.6	54.5	8.7	3.8	45.0	75.0
8	8.25	7.21	240	160	202	90	38	70	80.2	54.5	9.7	7.3	53.0	71.0
7	8.24	7.24	266	210	212	130	54	80	71.3	66.5	21.4	10.7	51.0	76.0
8	8.33	7.13	272	218	210	128	62	90	86.6	84.2	10.7	2.4	n/a	n/a
9	8.29	7.22	264	224	210	130	54	94	86.6	75.4	11.7	8.7	50.0	80.0
10	8.38	7.36	280	216	214	122	46	94	81.8	73.7	13.6	7.8	48.0	80.0
11	8.35	7.46	286	230	216	126	70	104	81.0	73.7	20.4	11.2	46.0	82.0
12	8.33	7.43	266	218	208	120	58	98	99.4	72.1	4.4	9.2	45.0	76.0
13	8.28	7.24	278	202	216	114	62	88	85.8	59.3	15.6	13.1	48.0	66.0
14	8.23	7.30	254	220	208	138	56	82	68.9	68.1	22.4	12.2	45.0	72.0
15	8.06	7.42	242	206	184	122	58	84	66.5	65.7	18.5	10.2	43.0	73.0
16	8.05	7.12	234	214	196	118	38	96	81.0	69.7	7.8	9.7	41.0	90.0
17	8.16	7.21	246	206	200	98	46	108	85.8	65.7	7.8	10.2	41.0	85.0
18	8.29	7.27	280	212	206	116	74	96	77.0	64.9	14.6	12.2	47.0	80.0
19	8.24	7.27	266	214	214	120	52	94	85.8	69.7	12.8	9.7	43.0	78.0
20	8.22	7.44	254	220	212	124	42	96	85.8	70.5	9.7	10.7	43.0	80.0
21	8.23	7.42	246	226	208	118	38	108	77.8	74.5	12.6	9.7	45.0	85.0
22	8.33	7.50	244	216	208	118	36	98	79.4	72.1	11.2	8.7	42.0	85.0
23	8.22	7.49	248	222	208	114	40	108	82.6	72.9	10.2	9.7	48.0	87.0
24	8.24	7.52	258	228	208	118	50	110	78.6	72.9	15.1	11.2	42.0	80.0
25	8.30	7.49	240	228	208	124	32	104	8.6	75.4	9.7	11.2	42.0	82.0
26	8.28	7.30	248	220	208	120	40	100	84.2	81.0	9.2	4.4	41.0	80.0
27	8.21	7.55	242	226	208	126	34	100	78.6	77.0	11.2	8.3	41.0	84.0
28	8.28	7.46	242	240	208	126	34	114	82.6	80.2	8.8	9.7	43.0	87.0
29	8.23	7.46	254	224	210	114	44	110	83.4	78.6	11.2	6.8	42.0	88.0
30	8.33	7.48	256	230	216	132	40	98	83.4	79.4	11.7	7.8	42.0	88.0
31	8.32	7.41	248	242	212	130	36	112	77.8	74.5	13.1	13.6	40.0	78.0
Avg.	8.27	7.37	254	206	207	113	48	93	78.3	68.6	12.3	9.1	44.4	77.2
Max.	8.44	7.71	286	242	216	136	74	114	99.4	84.2	22.4	13.6	53	90
Min.	8.05	7.07	232	120	184	60	28	50	8.6	42.5	4.4	2.4	40	41

softening

Where? Softening?

Water to softening

Approx 1-2 to softening unit for each 1000 - 5000

Hardness - Alk = N Hardness

Bacteriological &
Physical ParametersCity of Flint Water Treatment Plant
WSSN: 2310

May 2014

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Date	Total Coliform						Standard Plate Count		Wind Direction	Temp. C	Color		Odor	
	Raw (Coliport MPN)		Filter Confluence (N&S)		Plant Tap									
	# Samples	Count	# Samples	# pos	# Samples	# pos	Raw	Tap		Raw	Raw	Tap	Raw	Tap
1	1	1166	12	0	1	0	14760	<2		12.6				
2	1	864	12	0	1	0	800	<2		13.2				
3	1	930	12	0	1	0	1300	<2		12.0				
4	1	974	12	0	1	0	>14760	<2		13.6				
5	1	882	12	0	1	0	>14760	<2		12.5				
6	1	618	12	0	1	0	12460	<2		14.9				
7	1	728	12	0	1	0	>14760	<2		14.3				
8	1	426	12	0	1	0	9400	<2		13.4				
9	1	342	12	0	1	0	>14760	<2		16.6				
10	1	610	12	0	1	0	>14760	2		17.6				
11	1	220	12	0	1	0	>14760	2		18.1				
12	1	218	12	0	1	0	>14760	<2		18.3				
13	1	126	12	0	1	0	11100	<2		19.5				
14	1	2910	12	0	1	0	>14760	<2		19.6				
15	1	16328	12	0	1	0	14760	<2		17.4				
16	1	12588	12	0	1	0	6660	<2		13.2				
17	1	3720	12	1	1	0	3320	2		14.3				
18	1	1618	12	0	1	0	7840	<2		16.7				
19	1	4494	12	0	1	0	16.1	<2		16.1				
20	1	1816	12	0	1	0	860	<2		17.2				
21	1	4764	12	0	1	0	14760	<2		18.2				
22	1	2934	12	0	1	0	7440	<2		19.0				
23	1	960	12	0	1	0	7840	<2		18.0				
24	1	682	12	0	1	0	3780	<2		18.3				
25	1	398	12	0	1	0	14760	2		18.7				
26	1	482	12	0	1	0	>14760	<2		21.4				
27	1	2034	12	0	1	0	1600	<2		20.6				
28	1	2028	12	0	1	0	7440	<2		21.1				
29	1	918	12	0	1	0	5740	<2		20.6				
30	1	852	12	0	1	0	2160	<2		22.3				
31	1	1166	12	0	1	0	3320	<2		22.7				
Avg.										17.2				
Max.							> 14760	2		22.7				
Min.										12.0				

verif
7.4 = todiff. lab
results?

>14760

Doing 1/20th
d.utions
to get #s54 wells -
Fluorescenttent
2-5 h hrs
wells53 wells
14760Following
methods2-5 h hrs
well
Fluorescent2
NO
wells
Fluorescent

Distribution System
MonitoringCity of Flint Water Treatment Plant
WSSN: 2310

May 2014

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Free Chlorine Residual at Bacteriological Monitoring Stations mg/l

Date	1	2	3	4	5	6	7	8	CS	WR	Number of Samples
1									0.6	0.8	2
2									0.6	0.8	2
3											0
4											0
5									0.7	0.6	2
6									1.1	1.4	2
7	1.0	1.3	0.9	1.0	0.9	0.9	0.9	1.3	0.4	0.6	10
8	1.1	1.3	1.0	1.4	0.9	1.1	0.9	1.4	0.8	0.6	10
9									0.7	0.6	2
10											0
11											0
12									0.3	0.4	2
13									0.3	0.4	2
14	1.0	0.7	1.0	1.0	0.7	0.7	0.9	0.7	0.3	0.4	10
15	0.6	0.5	0.5	0.3	0.2	0.3	0.2	0.4	0.2		9
16									0.3		1
17											0
18											0
19									0.4	0.3	2
20									0.3	0.3	2
21	0.3	1.2	0.7	0.8	0.5	1.0	0.7	1.2	0.3	0.3	10
22	0.8	0.9	0.7	0.4					0.3	0.2	6
23									0.3	0.2	2
24											0
25											0
26									0.3	0.3	2
27									0.2	0.0	2
28	0.7	0.9	0.6	0.1	0.5	0.6	0.5	1.0	0.2	0.7	10
29	0.7	1.1	0.6	0.9	0.3	0.9	0.9	1.1	0.3	0.7	10
30											0
31											0

TURN-OVER @ Reservoirs
MIXING
TRIM Formation - stagnation?

Bolacmy
Act 0

Correlate location of ROS w/ HPC?
high HPC
- give us the results

Distribution Sample Summary

Total # of routine distribution samples analyzed	100
Total # of routine distribution samples required	100

Distribution Disinfectant Free Residual Summary

Percent samples with a detectable disinfectant residual	99
Average disinfectant residual this month	0.7

Distribution Bacteriological Summary

Total # of positive routine distribution samples	0
Percent of routine distribution samples positive	0

Positive Distribution Samples

Date	Monitoring Station	Date	Repeat Monitoring Stations	Residual	Positive or Negative

WTP Pressure
Chlorine
WR Fill
to Reservoir
helps
logAL GFT

Adding Potable Chlorine

WTP
CARCINOM HYPOTHESIS that were
being used @ WTP int.

4-16
F-T

Disinfectants
MOR
Res. Disinfectants?

**Distribution System
Monitoring**

 City of Flint Water Treatment Plant
WSSN: 2310

May 2014

Page 7

Date	Total Chlorine Residual at Bacteriological Monitoring Stations mg/l										Number of Sample
	1	2	3	4	5	6	7	8	CS	WR	
1									0.7	1.0	2
2									0.7	0.8	2
3											0
4											0
5									1.0	0.8	2
6									1.9	0.9	2
7	1.5	1.7	1.4	1.4	1.1	1.1	1.1	1.7	0.6	0.9	10
8	1.6	1.9	1.2	1.7	1.3	1.7	1.3	1.7	0.9	1.1	10
9									0.9	0.8	2
10											0
11											0
12									0.4	0.6	2
13									0.4	0.7	2
14	1.3	1.0	1.4	1.3	1.0	1.1	1.2	0.9	0.4	0.7	10
15	0.8	0.7	1.0	0.6	0.5	0.7	0.7	0.7	0.3		9
16									0.4		1
17											0
18											0
19									0.5	0.5	2
20									0.4	0.5	2
21	0.4	1.9	1.2	1.3	1.0	1.5	1.1	1.6	0.4	0.4	10
22	1.2	1.5	1.0	1.7					0.5	0.3	6
23									0.4	0.3	2
24											0
25											0
26											0
27									0.4	0.2	2
28	1.1	1.2	1.0	0.3	0.8	1.1	0.9	1.4	0.3	0.2	10
29	1.1	1.5	1.1	1.1	0.5	1.1	1.1	1.2	0.5	0.3	10
30											0
31											0

Distribution Disinfectant Total Residual Summary	
Percent samples with a detectable disinfectant residual	100
Average disinfectant residual this month	1.0

Cover Page Notes:

1. Filter head loss meters are not operational on our SCADA. They will be operational after our SCADA upgrades are complete. The SCADA upgrades are out for bid at the moment.
2. No cost analysis done for chemicals or power. An accurate chemical cost could not be determined due to polymer usage. We were given significant quantities (4-5 days) of polymer to use as a trial on two different occasions. No power cost was determined because I am trying to gain access to the correct monthly power cost.
3. POE continuous chlorine residual monitoring equipment has not been installed. We plan to move the continuous chlorine analyzer from the 3MG Well to the discharge side of the high service pumps. At this time we are taking residuals in the 3MG well, and using our lab tap to represent POE. → not on-line?

Report Notes:

1. Plant operations were shut down on 5/12 until 5/14. This was done to drain a softening clarifier and change plant set-up to test a new polymer. Storage reservoirs were utilized during this time.

new polymer?
MDEQ approval - spec. shd
NTP std 80

Add polymer feed
to MGR

Ref. 500 in MGR Res 500 A

Five days to go → need to have it
Nothing the rules to not have it → have not had
ASAP by Fri
otherwise 1/2 hrs
CL sampler

→ rats as known
to verify NTP GO APPR

DEO
RESOURCE MANAGEMENT DIVISION

MAY 15 2014

LANSING DISTRICT



Coagulation Parameters

WSSN 2310

Apr-14

D A T E	Total Million Gallons Purchased	Million Gallons to County	Million Gallons to Flint	4	5	Ferric Chloride as Fe 3+ mg/l	Turbidity, NTU units						
							Raw				Plant Tap		
							# of Sample s	Avg.	Max		# of Samples	Avg.	Max
	1	1A	1B			6	7	8	9	10	11	12	13
1		0.00									3	0.12	0.18
2		0.00									3	0.08	0.08
3		0.00									3	0.07	0.08
4		0.00									3	0.08	0.08
5		0.00									3	0.07	0.08
6		0.00									3	0.07	0.08
7		0.00									2	0.08	0.10
8		0.00									3	0.08	0.08
9		0.00									3	0.08	0.10
10		0.00									3	0.07	0.08
11		0.00									3	0.06	0.07
12		0.00									3	0.08	0.08
13		0.00									3	0.06	0.06
14		0.00									1	0.09	0.09
15		0.00									1	0.11	0.11
16		0.00									0	n.s	n.s
17		0.00									3	0.07	0.08
18		0.00									3	0.06	0.07
19		0.00									3	0.06	0.07
20		0.00									0	n.s	n.s
21		0.00									3	0.08	0.08
22		0.00									3	0.07	0.08
23		0.00									3	0.07	0.07
24		0.00									3	0.07	0.08
25		0.00					2	10.2	11.8		1	0.10	0.10
26		0.00					2	11.4	13.4		2	0.08	0.10
27		0.00					2	11.4	13.7		2	0.07	0.08
28		0.00					2	14.6	15.6		2	0.07	0.07
29		0.00					2	11.3	13.2		2	0.06	0.07
30		0.00					2	10.5	11.1		2	0.08	0.10
AVG	#DIV/0!	0.00	#####				2	11.6	13.1		2	0.08	0.08
MAX	0.00	0.00	0.00				2	14.6	15.6		3	0.12	0.18
MIN	0.00	0.00	0.00				2	10.2	11.1		0	0.06	0.06
Total	0.00	0.00	0.00										

NOT COMPLETED



Flouridation & Chlorination

WSSN 2310

Apr-14

D A T E	Fluorid e Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorin e mg/L	B&P	Sta II	Dort	3MG Well		Tap		
		Free	Free	Free				Free			Free				
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.59					0.8	0.9	0.9	0.9			0.9	
2			0.58					1.0	1.0	0.9	0.9			0.9	
3			0.63					0.8	1.1	1.0	0.9			0.9	
4			0.65					1.0	1.1	0.9	1.0			1.0	
5			0.66					1.0	1.1	1.1	1.0			1.1	
6			0.65					1.0	1.0	1.0	1.0			0.9	
7			0.71					n.s	n.s	n.s	n.s			1.0	
8			0.68					0.8	1.0	0.9	0.9			0.9	
9			0.64					1.0	1.0	0.9	0.9			0.8	
10			0.68					0.9	1.0	0.9	0.9			0.8	
11			0.64					1.0	1.2	1.0	1.0			1.0	
12			0.63					0.8	0.9	0.8	0.8			1.0	
13			0.67					0.9	1.0	0.9	0.8			0.9	
14			0.62					0.9	1.0	1.0	0.9			1.0	
15			0.54					0.9	1.1	1.0	n/a			1.0	
16			0.54					0.9	1.0	0.9	n/a			0.8	
17			0.59					0.8	1.1	0.9	n/a			0.9	
18			0.54					0.9	1.0	1.0	n/a			1.0	
19			0.57					0.8	1.0	0.9	n/a			1.0	
20			n/a					n.s	n.s	n.s	n/a			n.s	
21			0.61					0.9	1.0	0.9	n/a			1.0	
22			0.66					0.8	1.1	0.9	n/a			1.0	
23			0.61					0.8	1.0	0.9	n/a			0.8	
24			0.61					n.s	1.0	0.9	n/a			0.9	
25		0.14	0.59			3.5		n.s	n/a	n.s	1.7			0.8	
26		0.14	0.53			3.5		n.s	n/a	n.s	1.6			0.9	
27		0.13	0.53			3.6		n.s	n/a	n.s	1.5			1.0	
28		0.13	0.19			3.7		n.s	n/a	n.s	1.4			0.9	
29		0.15	0.58			3.7		n.s	n/a	n.s	1.5			0.9	
30		0.15	0.62			3.5		n.s	n/a	n.s	1.7			0.8	
AVG		0.14	0.60			3.6		0.9	1.0	0.9	1.1			0.9	
MAX		0.15	0.71			3.7		1.0	1.2	1.1	1.7			1.1	
MIN		0.13	0.19			3.5		0.8	0.9	0.8	0.8			0.8	

n.s. = no sample collected/tested



Chemical Analyses

WSSN 2310

Apr-14

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.57		98		74		24				30.5		5.3		
2		7.36		98		73		25				29.7		5.8		
3		7.33		98		74		24				30.5		5.3		
4		7.32		100		75		25				32.1		4.9		
5		7.44		100		76		24				30.5		5.8		
6		7.32		98		74		24				28.9		6.3		
7		7.41		100		73		27				31.3		5.3		
8		7.62		98		69		29				28.9		6.3		
9		7.46		98		72		26				29.7		5.8		
10		7.39		98		71		27				28.9		6.3		
11		7.34		100		75		25				31.3		5.3		
12		7.56		102		71		31				28.1		7.8		
13		7.37		96		64		32				28.9		5.8		
14		7.32		96		75		21				28.9		5.8		
15		7.46		98		73		25				28.9		6.3		
16		7.47		96		66		30				28.9		5.8		
17		7.32		96		71		25				29.7		5.3		
18		7.30		98		73		25				31.3		4.9		
19		7.28		100		72		28				28.9		6.8		
20		n.s		n.s		n.s		n.s				n.s		n.s		
21		7.34		98		74		24				29.7		5.8		
22		7.26		98		72		26				29.7		5.8		
23		7.25		98		71		27				29.7		5.8		
24		7.46		96		71		25				29.7		5.3		
25		7.39		96		75	0	21				29.7		5.3		
26	8.31	7.28	255	98	200	73	55	25			77.9	29.7	13.6	5.8	48	24
27	8.34	7.32	249	98	199	70	50	28			75.4	30.5	14.6	5.8	42	32
28	8.39	8.46	247	92	205	60	42	32			82.6	46.5	9.8	8.3	43	68
29	8.46	7.35	230	98	190	70	40	28			76.2	30.5	9.7	5.3		
30	8.41	7.30	248	98	208	73	40	25			72.1	29.7	17.5	5.8	45	17
AVG		7.42		98		72		26				30.4		5.9		
MAX		8.46		102		76		32				46.5		8.3		
MIN		7.25		92		60		21				28.1		4.9		

n.s. = no sample collected/tested



Bacteriological & Physical Parameters

WSSN 2310

Apr-14

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P	C.F.E.	Dort	3MG Well	C.S. #2	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					10.1				
2	1/0		2/0	2/0	2/0	2/0					10.1				
3	1/0		2/0	2/0	2/0	2/0					11.7				
4	1/0		2/0	2/0	2/0	2/0					11.7				
5	1/0		2/0	2/0	2/0	2/0					10.9				
6	1/0		2/0	2/0	2/0	2/0					10.7				
7	0/0		0/0	0/0	0/0	2/0					11.3				
8	1/0		2/0	2/0	2/0	2/0					9.9				
9	1/0		2/0	2/0	2/0	2/0					10.2				
10	1/0		2/0	2/0	2/0	2/0			< 2		8.8				
11	1/0		2/0	2/0	2/0	2/0					9.1				
12	1/0		2/0	2/0	2/0	2/0					10.1				
13	1/0		2/0	2/0	2/0	2/0					9.8				
14	1/0		2/0	2/0	2/0	2/0					9.9				
15	1/0		2/0	2/0	2/0	2/0					8.9				
16	1/0		2/0	2/0	2/0	2/0					10.6				
17	1/0		2/0	0/0	2/0	2/0					9.4				
18	1/0		1/0	0/0	1/0	2/0					9.2				
19	1/0		2/0	0/0	2/0	2/0					8.3				
20	0/0		0/0	0/0	0/0	0/0					n.s				
21	1/0		2/0	0/0	2/0	2/0					8.1				
22	1/0		2/0	0/0	2/0	2/0					7.7				
23	1/0		2/0	0/0	2/0	2/0					9.3				
24	1/0		2/0	2/0	2/0	2/0					8.7				
25	1/0	10/0	0/0	1/0	n/a	1/0			< 2		8.7				
26	1/0	12/0	0/0	1/0	n/a	1/0		> 1476	< 2		9.0				
27	1/0	12/0	0/0	1/0	n/a	1/0		142	< 2		8.8				
28	1/0	12/0	0/0	1/0	n/a	1/0		532	< 2		7.9				
29	1/0	4/0	0/0	1/0	n/a	1/0			< 2		8.5				
30	1/0	6/0	0/0	1/0	n/a	1/0		1246	< 2		10.3				
C.F.E. = Combined Filter Effluent											9.6				
											11.7				
											7.7				

n.s. = no sample collected/tested

Apr-14

[illegible]

Apr-14

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Apr-14

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				114			
Total number of routine distribution samples required:				100			

RAW & AT TURBS 1/4 HRS = 6 PER DAY

Total # of Turb. samples taken ?

Applied ?

CFE - TURBS ?
YES → 1/4 HRS



Coagulation Parameters

WSSN 2310

Apr-14

DATE	Total Million Gallons Purchased	Million Gallons to County	Million Gallons to Flint			Ferric Chloride as Fe 3+ mg/l	Turbidity, NTU units						
							Raw			Plant Tap			
							# of Samples	Avg.	Max	# of Samples	Avg.	Max	
													7
1		1A	1B	4	5	6	7	8	9	10	11	12	13
1		0.00									3	0.12	0.18
2		0.00									3	0.08	0.08
3		0.00									3	0.07	0.08
4		0.00									3	0.08	0.08
5		0.00									3	0.07	0.08
6		0.00									3	0.07	0.08
7		0.00									2	0.08	0.10
8		0.00									3	0.08	0.08
9		0.00									3	0.08	0.10
10		0.00									3	0.07	0.08
11		0.00									3	0.06	0.07
12		0.00									3	0.08	0.08
13		0.00									3	0.06	0.06
14		0.00									1	0.09	0.09
15		0.00									1	0.11	0.11
16		0.00									0	n.s	n.s
17		0.00									3	0.07	0.08
18		0.00									3	0.06	0.07
19		0.00									3	0.06	0.07
20		0.00									0	n.s	n.s
21		0.00									3	0.08	0.08
22		0.00									3	0.07	0.08
23		0.00									3	0.07	0.07
24		0.00									3	0.07	0.08
25		0.00					2	10.2	11.8		1	0.10	0.10
26		0.00					2	11.4	13.4		2	0.08	0.10
27		0.00					2	11.4	13.7		2	0.07	0.08
28		0.00					2	14.6	15.6		2	0.07	0.07
29		0.00					2	11.3	13.2		2	0.06	0.07
30		0.00					2	10.5	11.1		2	0.08	0.10
AVG	#DIV/0!	0.00	#####				2	11.6	13.1		2	0.08	0.08
MAX	0.00	0.00	0.00				2	14.6	15.6		3	0.12	0.18
MIN	0.00	0.00	0.00				2	10.2	11.1		0	0.06	0.06
Total	0.00	0.00	0.00										

CFE column

IND. V. FILTER TURBS ?
YES

OPS REC. 1/HR

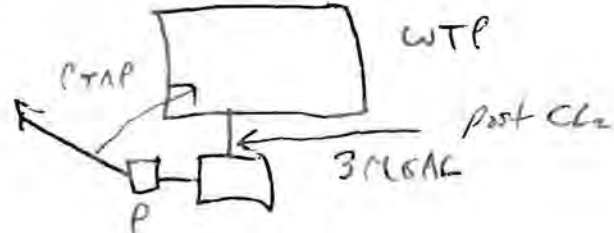
SCADA MCH. CAN

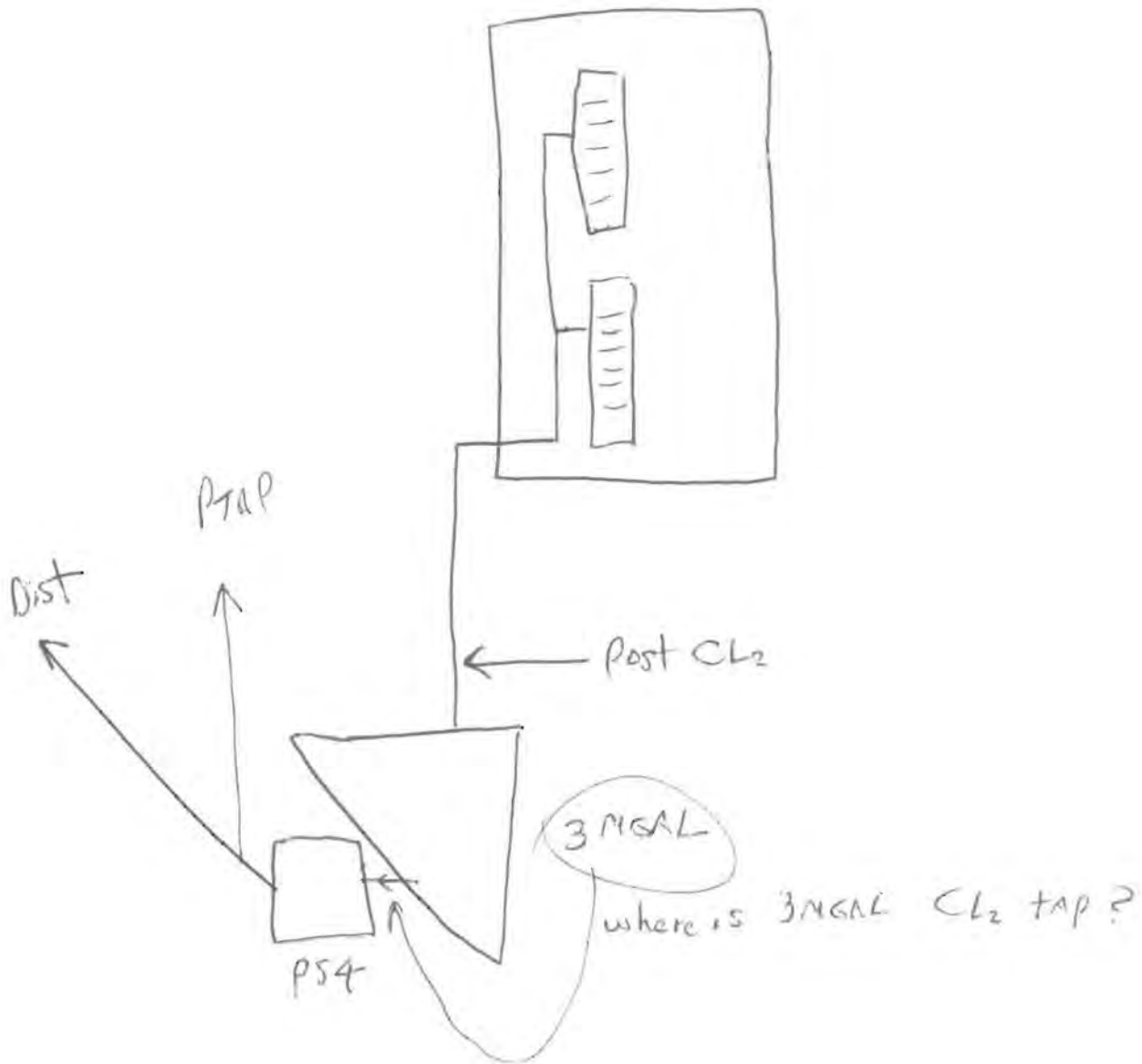
CAN PULL UP ON SCREEN

Birds next wk

Production ?

Ferric ?
30 30 mg/l
as Ferric as IRON





Applied → ~~Chlorine~~ ?
Post ?

Residual
Applied - F.T. ?
F. Herd - F.T. ?

TAP - Total ?



Flouridation & Chlorination

WSSN 2310

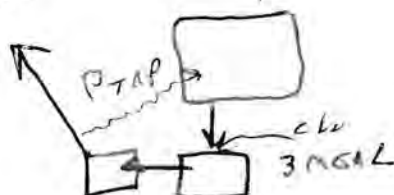
Apr-14

DATE	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCI-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well			Tap	
		Free	Free	Free				Free			Free				
		14	15	16				17	18	19	20	21	22	23	24
1			0.59					0.8	0.9	0.9	0.9			0.9	
2			0.58					1.0	1.0	0.9	0.9			0.9	
3			0.63					0.8	1.1	1.0	0.9			0.9	
4			0.65					1.0	1.1	0.9	1.0			1.0	
5			0.66					1.0	1.1	1.1	1.0			1.1	
6			0.65					1.0	1.0	1.0	1.0			0.9	
7			0.71					n.s	n.s	n.s	n.s			1.0	
8			0.68					0.8	1.0	0.9	0.9			0.9	
9			0.64					1.0	1.0	0.9	0.9			0.8	
10			0.68					0.9	1.0	0.9	0.9			0.8	
11			0.64					1.0	1.2	1.0	1.0			1.0	
12			0.63					0.8	0.9	0.8	0.8			1.0	
13			0.67					0.9	1.0	0.9	0.8			0.9	
14			0.62					0.9	1.0	1.0	0.9			1.0	
15			0.54					0.9	1.1	1.0	n/a			1.0	
16			0.54					0.9	1.0	0.9	n/a			0.8	
17			0.59					0.8	1.1	0.9	n/a			0.9	
18			0.54					0.9	1.0	1.0	n/a			1.0	
19			0.57					0.8	1.0	0.9	n/a			1.0	
20			n/a					n.s	n.s	n.s	n/a			n.s	
21			0.61					0.9	1.0	0.9	n/a			1.0	
22			0.66					0.8	1.1	0.9	n/a			1.0	
23			0.61					0.8	1.0	0.9	n/a			0.8	
24			0.61					n.s	1.0	0.9	n/a			0.9	
25		0.14	0.59				3.5	n.s	n/a	n.s	1.7			0.8	
26		0.14	0.53				3.5	n.s	n/a	n.s	1.6			0.9	
27		0.13	0.53				3.6	n.s	n/a	n.s	1.5			1.0	
28		0.13	0.19				3.7	n.s	n/a	n.s	1.4			0.9	
29		0.15	0.58				3.7	n.s	n/a	n.s	1.5			0.9	
30		0.15	0.62				3.5	n.s	n/a	n.s	1.7			0.8	
AVG		0.14	0.60				3.6	0.9	1.0	0.9	1.1			0.9	
MAX		0.15	0.71				3.7	1.0	1.2	1.1	1.7			1.1	
MIN		0.13	0.19				3.5	0.8	0.9	0.8	0.8			0.8	

n.s. = no sample collected/tested

CFEs Monitored

Dst



CT ?

Continuous

Applied Cl₂ ?
Filtered ?

Continuous ?
1/4 Hrs

PDE Needs Continuous

H.S. Disch. Needs Cont. Cl₂ Mon.



Chemical Analyses

WSSN 2310

Apr-14

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.57		98		74		24				30.5		5.3		
2		7.36		98		73		25				29.7		5.8		
3		7.33		98		74		24				30.5		5.3		
4		7.32		100		75		25				32.1		4.9		
5		7.44		100		76		24				30.5		5.8		
6		7.32		98		74		24				28.9		6.3		
7		7.41		100		73		27				31.3		5.3		
8		7.62		98		69		29				28.9		6.3		
9		7.46		98		72		26				29.7		5.8		
10		7.39		98		71		27				28.9		6.3		
11		7.34		100		75		25				31.3		5.3		
12		7.56		102		71		31				28.1		7.8		
13		7.37		96		64		32				28.9		5.8		
14		7.32		96		75		21				28.9		5.8		
15		7.46		98		73		25				28.9		6.3		
16		7.47		96		66		30				28.9		5.8		
17		7.32		96		71		25				29.7		5.3		
18		7.30		98		73		25				31.3		4.9		
19		7.28		100		72		28				28.9		6.8		
20		n.s.		n.s.		n.s.		n.s.				n.s.		n.s.		
21		7.34		98		74		24				29.7		5.8		
22		7.26		98		72		26				29.7		5.8		
23		7.25		98		71		27				29.7		5.8		
24		7.46		96		71		25				29.7		5.3		
25		7.39		96		75	0	21				29.7		5.3		
26	8.31	7.28	255	98	200	73	55	25			77.9	29.7	13.6	5.8	48	24
27	8.34	7.32	249	98	199	70	50	28			75.4	30.5	14.6	5.8	42	32
28	8.39	8.46	247	92	205	60	42	32			82.6	46.5	9.8	8.3	43	68
29	8.46	7.35	230	98	190	70	40	28			76.2	30.5	9.7	5.3		
30	8.41	7.30	248	98	208	73	40	25			72.1	29.7	17.5	5.8	45	17
AVG		7.42		98		72		26				30.4		5.9		
MAX		8.46		102		76		32				46.5		8.3		
MIN		7.25		92		60		21				28.1		4.9		

n.s. = no sample collected/tested

T. Coliform
RAW ?



Bacteriological & Physical Parameters

WSSN 2310

Apr-14

DATE	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap											Raw	Tap	Raw	Tap
	B&P	C.F.E.	Dort	3MG Well	C.S. #2	Lab Tap									
	60	61	62	63	64	65		66	67			68	69	70	71
1	1/0		2/0	2/0	2/0	2/0					10.1				
2	1/0		2/0	2/0	2/0	2/0					10.1				
3	1/0		2/0	2/0	2/0	2/0					11.7				
4	1/0		2/0	2/0	2/0	2/0					11.7				
5	1/0		2/0	2/0	2/0	2/0					10.9				
6	1/0		2/0	2/0	2/0	2/0					10.7				
7	0/0		0/0	0/0	0/0	2/0					11.3				
8	1/0		2/0	2/0	2/0	2/0					9.9				
9	1/0		2/0	2/0	2/0	2/0					10.2				
10	1/0		2/0	2/0	2/0	2/0			< 2		8.8				
11	1/0		2/0	2/0	2/0	2/0					9.1				
12	1/0		2/0	2/0	2/0	2/0					10.1				
13	1/0		2/0	2/0	2/0	2/0					9.8				
14	1/0		2/0	2/0	2/0	2/0					9.9				
15	1/0		2/0	2/0	2/0	2/0					8.9				
16	1/0		2/0	2/0	2/0	2/0					10.6				
17	1/0		2/0	0/0	2/0	2/0					9.4				
18	1/0		1/0	0/0	1/0	2/0					9.2				
19	1/0		2/0	0/0	2/0	2/0					8.3				
20	0/0		0/0	0/0	0/0	0/0					n.s				
21	1/0		2/0	0/0	2/0	2/0					8.1				
22	1/0		2/0	0/0	2/0	2/0					7.7				
23	1/0		2/0	0/0	2/0	2/0					9.3				
24	1/0		2/0	2/0	2/0	2/0					8.7				
25	1/0	10/0	0/0	1/0	n/a	1/0			< 2		8.7				
26	1/0	12/0	0/0	1/0	n/a	1/0		> 1476	< 2		9.0				
27	1/0	12/0	0/0	1/0	n/a	1/0		142	< 2		8.8				
28	1/0	12/0	0/0	1/0	n/a	1/0		532	< 2		7.9				
29	1/0	4/0	0/0	1/0	n/a	1/0			< 2		8.5				
30	1/0	6/0	0/0	1/0	n/a	1/0		1246	< 2		10.3				
C.F.E. = Combined Filter Effluent											9.6				
											11.7				
											7.7				

n.s. = no sample collected/tested

6 = 1/4 hrs
4

Apr-14

[illegible]

Apr-14

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Apr-14

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				114			
Total number of routine distribution samples required:				100			

CFES

CFEN

need
results of
each 4HR period
to get compliance

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of March 2014

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION

Michael Glasgow
SIGNATURE OF APPROPRIATE OFFICIAL

DEQ
RESOURCE MANAGEMENT DIVISION

APR 14 2014

TREATMENT RATE AND FILTER DATA

LANSING DISTRICT

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

Mar-14

[illegible]



Flouridation & Chlorination

WSSN 2310

Mar-14

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well		Tap		
		Raw	Tap	Dist				Free	Free	Free	Free			Free	
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.48					0.7	1.2	0.9	0.9			0.9	
2			0.51					0.8	1.0	0.9	0.8			0.9	
3			0.49					0.8	1.0	0.9	0.8			1.0	
4			0.51					0.9	1.0	1.0	0.9			1.0	
5			0.52					0.9	1.0	0.9	0.9			0.8	
6			0.53					0.7	1.0	1.0	0.9			1.0	
7			0.52					0.9	1.0	0.9	0.9			1.0	
8			0.52					0.9	1.1	1.0	1.0			1.1	
9			0.49					0.7	1.0	0.9	0.8			0.8	
10			0.51					0.8	0.9	0.9	0.9			1.0	
11			0.52					0.9	1.0	0.9	0.8			1.0	
12			0.51					0.9	1.0	1.0	0.9			0.9	
13			0.49					0.8	1.2	0.9	0.8			0.9	
14			0.48					0.9	1.0	1.0	0.9			1.0	
15			0.43					0.9	1.0	0.9	0.8			1.0	
16			0.48					0.8	1.1	0.9	0.8			1.1	
17			0.53					0.9	1.0	0.9	0.9			0.9	
18			0.54					0.8	1.1	1.0	0.9			0.9	
19			0.54					0.9	1.2	1.0	0.9			1.0	
20			0.52					0.8	1.0	0.9	0.9			1.0	
21			0.52					1.0	1.2	1.0	0.9			1.1	
22			0.54					0.8	1.1	1.0	1.0			1.0	
23			0.58					0.8	1.0	0.9	0.9			1.0	
24			0.50					0.9	1.1	1.1	1.0			1.0	
25			0.53					0.9	1.1	1.0	1.0			1.1	
26			0.53					0.9	1.2	0.9	0.9			0.9	
27			0.54					0.9	1.1	1.0	1.1			1.1	
28			0.54					1.0	1.2	1.0	0.9			1.0	
29			0.61					0.9	1.0	0.8	0.9			1.0	
30			0.58					0.8	1.2	0.9	0.9			1.0	
31			0.55					0.8	1.0	0.9	0.9			1.0	
AVG			0.52					0.9	1.1	0.9	0.9			1.0	
MAX			0.61					1.0	1.2	1.1	1.1			1.1	
MIN			0.43					0.7	0.9	0.8	0.8			0.8	

n.s. = no sample collected/tested



Chemical Analyses

WSSN 2310

Mar-14

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.35		98		71		27				29.7		5.8		
2		7.36		98		65		33				28.9		6.3		
3		7.36		98		71		27				29.7		5.8		
4		7.37		98		73		25				28.9		6.3		
5		7.56		100		75		25				29.7		6.3		
6		7.41		98		71		27				29.7		5.8		
7		7.36		98		75		23				30.5		5.3		
8		7.49		98		70		28				28.1		6.8		
9		7.32		98		64		34				29.7		5.8		
10		7.36		96		74		22				31.3		4.4		
11		7.45		98		72		26				29.7		5.8		
12		7.39		98		72		26				29.7		5.8		
13		7.45		98		72		26				29.7		5.8		
14		7.34		98		74		24				30.9		5.1		
15		7.40		98		69		29				29.7		5.8		
16		7.33		98		65		33				29.7		5.8		
17		7.40		98		65		33				29.7		5.8		
18		7.30		98		74		24				29.7		5.8		
19		7.41		98		75		23				29.7		5.8		
20		7.44		98		70		28				29.7		5.8		
21		7.38		98		74		24				29.7		5.8		
22		7.42		98		72		26				28.1		6.8		
23		7.31		98		72		26				29.7		5.8		
24		7.41		98		75		23				32.1		3.6		
25		7.44		98		74		24				31.3		4.9		
26		7.45		98		73		25				28.9		6.3		
27		7.41		102		77		25				30.5		6.3		
28		7.47		102		77		25				31.3		5.8		
29		7.33		98		74		24				29.7		5.8		
30		7.22		98		70		28				29.7		5.8		
31		7.35		100		74		26				29.7		6.3		
AVG		7.39		98		72		26				29.8		5.8		
MAX		7.56		102		77		34				32.1		6.8		
MIN		7.22		96		64		22				28.1		3.6		

n.s. = no sample collected/tested

**Bacteriological & Physical Parameters****WSSN 2310****Mar-14**

Bacteriological & Physical Parameters															
D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Pump	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					11.4				
2	1/0		2/0	2/0	2/0	2/0					11.8				
3	1/0		2/0	2/0	2/0	2/0					12.1				
4	1/0		2/0	2/0	2/0	2/0					11.1				
5	1/0		2/0	2/0	2/0	2/0			< 2		13.3				
6	1/0		2/0	2/0	2/0	2/0					11.1				
7	1/0		2/0	2/0	2/0	2/0					11.4				
8	1/0		2/0	2/0	2/0	2/0					10.7				
9	1/0		2/0	2/0	2/0	2/0					13.1				
10	1/0		2/0	2/0	2/0	2/0					10.5				
11	1/0		2/0	2/0	2/0	2/0					11.7				
12	1/0		2/0	2/0	2/0	2/0					11.6				
13	1/0		2/0	2/0	2/0	2/0					12.2				
14	1/0		2/0	2/0	2/0	2/0					11.7				
15	1/0		2/0	2/0	2/0	2/0					11.9				
16	1/0		2/0	2/0	2/0	2/0					11.3				
17	1/0		2/0	2/0	2/0	2/0					11.1				
18	1/0		2/0	2/0	2/0	2/0					10.5				
19	1/0		2/0	2/0	2/0	2/0					10.0				
20	1/0		2/0	2/0	2/0	2/0					10.6				
21	1/0		2/0	2/0	2/0	2/0					13.1				
22	1/0		2/0	2/0	2/0	2/0					11.7				
23	1/0		2/0	2/0	2/0	2/0					12.1				
24	1/0		2/0	2/0	2/0	2/0					11.7				
25	1/0		2/0	2/0	2/0	2/0					10.6				
26	1/0		2/0	2/0	2/0	2/0					10.8				
27	1/0		2/0	2/0	2/0	2/0					11.1				
28	1/0		2/0	2/0	2/0	2/0					12.7				
29	1/0		2/0	2/0	2/0	2/0					12.9				
30	1/0		2/0	2/0	2/0	2/0					12.6				
31	1/0		2/0	2/0	2/0	2/0					10.6				
											11.6				
											13.3				
											10.0				

n.s. = no sample collected/tested

Mar-14

[illegible]



Distribution System Monitoring

WSSN 2310

Mar-14

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Mar-14

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				153			
Total number of routine distribution samples required:				100			

**MONTHLY OPERATION REPORT
OF
WATER TREATMENT PLANT**

For Month of February 2014

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION

Michael Glasgow
SIGNATURE OF APPROPRIATE OFFICIAL

DEQ
WATER MANAGEMENT

MAR 13 2014

TREATMENT RATE AND FILTER DATA

LANSING DISTRICT

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

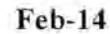
CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MP

[illegible]



Flouridation & Chlorination

WSSN 2310

Feb-14

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well		Tap		
		Free	Free	Free				Free			Free				
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.50				1.1	1.2	0.8	0.8			1.0		
2			0.49				0.8	1.0	0.9	0.9			0.9		
3			0.51				0.9	1.0	1.0	0.9			1.0		
4			0.52				0.9	1.0	1.0	0.9			1.0		
5			0.52				1.0	1.1	1.0	1.0			1.1		
6			0.50				0.9	1.0	0.9	0.9			0.9		
7			0.54				0.8	1.0	1.0	0.9			1.0		
8			0.54				1.0	1.1	1.0	1.0			1.1		
9			0.57				0.8	1.0	1.0	0.9			0.9		
10			0.59				1.1	1.1	1.0	0.9			0.9		
11			0.58				0.9	1.1	1.1	1.0			1.1		
12			0.56				0.9	1.2	1.1	1.0			1.0		
13			0.54				0.9	1.2	1.0	1.0			0.9		
14			0.57				1.0	1.2	1.0	1.0			1.0		
15			0.56				0.9	1.1	1.0	1.0			1.1		
16			0.54				0.8	1.0	1.0	0.9			1.0		
17			0.48				1.1	1.2	1.0	0.9			0.9		
18			0.51				1.0	1.0	1.0	1.0			0.9		
19			0.51				1.1	1.3	1.1	1.0			1.1		
20			0.51				0.9	1.1	1.0	1.0			1.0		
21			0.51				0.9	1.1	1.1	1.0			1.0		
22			0.48				0.8	1.0	0.9	0.9			1.0		
23			0.47				0.8	1.1	1.0	0.9			0.9		
24			0.52				0.8	0.9	0.9	0.8			0.9		
25			0.49				0.7	1.0	0.9	0.8			1.0		
26			0.50				0.9	1.1	1.0	0.9			1.0		
27			0.51				0.9	1.1	1.0	0.9			1.0		
28			0.51				0.9	1.1	1.0	0.9			1.0		
AVG			0.52				0.9	1.1	1.0	0.9			1.0		
MAX			0.59				1.1	1.3	1.1	1.0			1.1		
MIN			0.47				0.7	0.9	0.8	0.8			0.9		



Chemical Analyses

WSSN 2310

Feb-14

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.30		98		72		26				28.9		6.3		
2		7.26		98		69		29				28.1		6.8		
3		7.38		98		69		29				28.9		6.3		
4		7.36		96		74		22				32.9		3.4		
5		7.24		98		70		28				29.7		5.8		
6		7.43		96		70		26				28.9		5.8		
7		7.37		98		72		26				29.7		5.8		
8		7.44		96		74		22				29.7		5.3		
9		7.40		96		68		28				28.9		5.8		
10		7.40		98		71		27				29.7		5.8		
11		7.43		98		74		24				31.3		4.9		
12		7.32		96		74		22				31.3		4.4		
13		7.30		98		69		29				29.7		5.8		
14		7.30		96		74		22				30.5		4.9		
15		7.35		96		73		23				30.5		4.9		
16		7.25		98		71		27				28.9		6.3		
17		7.34		96		70		26				29.7		5.3		
18		7.24		98		70		28				29.7		5.8		
19		7.40		98		69		29				30.5		5.3		
20		7.34		98		70		28				30.5		5.3		
21		7.39		98		74		24				30.5		5.3		
22		7.29		98		71		27				28.9		6.3		
23		7.43		98		69		29				29.7		5.8		
24		7.32		96		69		27				30.5		4.9		
25		7.39		96		71		25				29.7		5.3		
26		7.39		98		73		25				30.5		5.3		
27		7.35		96		73		23				31.3		4.4		
28		7.37		98		72		26				30.5		5.3		
AVG		7.35		97		71		26				30.0		5.5		
MAX		7.44		98		74		29				32.9		6.8		
MIN		7.24		96		68		22				28.1		3.4		



Bacteriological & Physical Parameters

WSSN 2310

Feb-14

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap		
	B&P		Dort	3MG Well	Pump	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					12.9				
2	1/0		2/0	2/0	2/0	2/0					11.2				
3	1/0		2/0	2/0	2/0	2/0					11.3				
4	1/0		2/0	2/0	2/0	2/0					12.7				
5	1/0		2/0	2/0	2/0	2/0					11.8				
6	1/0		2/0	2/0	2/0	2/0					13.0				
7	1/0		2/0	2/0	2/0	2/0					13.2				
8	1/0		2/0	2/0	2/0	2/0					12.5				
9	1/0		2/0	2/0	2/0	2/0					12.8				
10	1/0		2/0	2/0	2/0	2/0					13.7				
11	1/0		2/0	2/0	2/0	2/0					13.6				
12	1/0		2/0	2/0	2/0	2/0			< 2		13.1				
13	1/0		2/0	2/0	2/0	2/0					12.7				
14	1/0		2/0	2/0	2/0	2/0					13.5				
15	1/0		2/0	2/0	2/0	2/0					13.7				
16	1/0		2/0	2/0	2/0	2/0					14.8				
17	1/0		2/0	2/0	2/0	2/0					11.2				
18	1/0		2/0	2/0	2/0	2/0					11.7				
19	1/0		2/0	2/0	2/0	2/0					11.7				
20	1/0		2/0	2/0	2/0	2/0					12.3				
21	1/0		2/0	2/0	2/0	2/0					12.3				
22	1/0		2/0	2/0	2/0	2/0					11.3				
23	1/0		2/0	2/0	2/0	2/0					9.3				
24	1/0		2/0	2/0	2/0	2/0					11.9				
25	1/0		2/0	2/0	2/0	2/0					11.3				
26	1/0		2/0	2/0	2/0	2/0					12.7				
27	1/0		2/0	2/0	2/0	2/0					12.1				
28	1/0		2/0	2/0	2/0	2/0					11.0				
											12.3				
											14.8				
											9.3				



Distribution System Monitoring

WSSN 2310

Feb-14

[illegible]



Distribution System Monitoring WSSN 2310 Feb-14

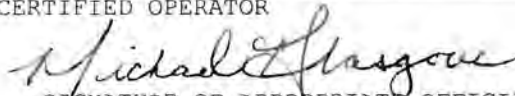
[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Feb-14

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				142			
Total number of routine distribution samples required:				100			

**MONTHLY OPERATION REPORT
OF
WATER TREATMENT PLANT****For Month of January 2014**Flint Water Plant
NAME OF WATER SYSTEM2310
WSSNGenesee
COUNTYMichael Glasgow
CERTIFIED OPERATORF-1R S-3
CLASSIFICATION
SIGNATURE OF APPROPRIATE OFFICIAL**TREATMENT RATE AND FILTER DATA**

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al3+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909



Jan-14

[illegible]



Flouridation & Chlorination

WSSN 2310

Jan-14

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
		Raw	Tap	Dist		Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well			Tap	
								Free	Free	Free	Free			Free	
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.51					0.8	0.9	0.8	0.8			0.9	
2			0.47					0.7	0.9	0.8	0.8			0.9	
3			0.48					0.8	0.9	0.8	0.8			0.9	
4			0.51					0.6	1.0	0.8	0.8			0.9	
5			0.48					0.7	1.0	0.9	0.9			0.8	
6			0.49					n.s.	1.0	0.8	0.8			1.1	
7			0.50					0.9	1.0	0.8	0.8			0.9	
8			0.52					0.9	1.0	0.8	0.8			0.9	
9			0.45					0.7	1.0	0.8	0.8			0.8	
10			0.51					1.0	1.1	0.8	0.8			0.9	
11			0.48					0.8	0.9	0.9	0.8			1.0	
12			0.49					0.7	0.9	0.8	0.8			0.9	
13			0.46					0.9	1.0	0.9	0.8			0.9	
14			0.47					0.80	1.00	0.90	0.90			0.9	
15			0.47					0.9	1.0	0.9	0.9			0.9	
16			0.46					0.7	1.0	0.9	0.9			0.9	
17			0.45					0.9	1.1	0.9	0.9			1.0	
18			0.40					0.8	1.0	0.9	0.9			0.9	
19			0.45					0.5	0.9	0.9	0.9			0.9	
20			0.45					0.8	1.0	0.9	0.8			1.0	
21			0.49					0.8	1.0	0.9	0.8			0.9	
22			0.52					1.0	1.1	0.9	0.9			1.0	
23			0.50					0.9	1.1	0.9	0.9			1.0	
24			0.49					1.0	1.1	0.9	0.9			1.0	
25			0.49					0.9	1.2	1.1	1.0			1.0	
26			0.53					0.8	1.0	0.8	0.8			0.9	
27			0.54					0.8	1.0	0.9	0.9			0.9	
28			0.50					0.7	1.0	1.0	0.9			1.0	
29			0.53					0.9	1.1	0.9	0.9			0.9	
30			0.47					0.9	1.0	0.9	0.9			0.9	
31			0.51					1.0	1.1	0.9	0.8			1.0	
AVG			0.49					0.8	1.0	0.9	0.9			0.9	
MAX			0.54					1.0	1.2	1.1	1.0			1.1	
MIN			0.40					0.5	0.9	0.8	0.8			0.8	

n.s. = no sample collected/tested



Chemical Analyses

WSSN 2310

Jan-14

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.32		98		62		36				28.9		6.3		
2		7.20		98		73		25				30.5		5.8		
3		7.35		100		73		27				28.9		6.8		
4		7.44		98		70		28				28.9		6.3		
5		7.39		98		70		28				29.7		5.8		
6		7.29		98		62		36				27.3		7.3		
7		7.33		102		65		37				31.3		5.8		
8		7.36		96		71		25				28.9		5.8		
9		7.25		100		68		32				29.7		6.3		
10		7.24		100		71		29				31.3		5.3		
11		7.30		96		66		30				28.9		5.8		
12		7.31		98		67		31				28.9		6.3		
13		7.40		98		69		29				28.1		6.8		
14		7.37		98		65		33				28.9		6.3		
15		7.35		98		68		30				28.9		6.3		
16		7.29		98		68		30				28.1		6.8		
17		7.26		96		69		27				32.1		3.9		
18		7.36		98		71		27				28.9		6.3		
19		7.47		96		63		33				28.9		5.8		
20		7.22		96		67		29				28.1		6.3		
21		7.28		98		67		31				28.9		6.3		
22		7.29		94		72		22				30.5		4.4		
23		7.38		94		72		22				32.1		3.4		
24		7.34		94		70		24				32.1		3.4		
25		7.38		96		71		25				28.9		5.8		
26		7.29		96		69		27				28.1		6.3		
27		7.34		98		68		30				28.1		6.8		
28		7.35		98		68		30				28.9		6.3		
29		7.34		98		68		30				28.1		6.8		
30		7.24		98		69		29				28.1		6.8		
31		7.32		96		73		23				28.9		5.8		
AVG		7.32		97		69		29				29.3		5.9		
MAX		7.47		102		73		37				32.1		7.3		
MIN		7.20		94		62		22				27.3		3.4		

n.s. = no sample collected/tested



Bacteriological & Physical Parameters

WSSN 2310

Jan-14

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Pump	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0				13.1					
2	1/0		2/0	2/0	2/0	2/0				12.4					
3	1/0		2/0	2/0	2/0	2/0				12.5					
4	1/0		2/0	2/0	2/0	2/0				11.7					
5	1/0		2/0	2/0	2/0	2/0				13.2					
6	0/0		2/0	2/0	2/0	2/0				11.7					
7	1/0		2/0	2/0	2/0	2/0				11.3					
8	1/0		2/0	2/0	2/0	2/0				14.2					
9	1/0		2/0	2/0	2/0	2/0				11.3					
10	1/0		2/0	2/0	2/0	2/0				13.3					
11	1/0		2/0	2/0	2/0	2/0				12.7					
12	1/0		2/0	2/0	2/0	2/0				12.7					
13	1/0		2/0	2/0	2/0	2/0				13.4					
14	1/0		2/0	2/0	2/0	2/0				14.2					
15	1/0		2/0	2/0	2/0	2/0				13.6					
16	1/0		2/0	2/0	2/0	2/0		< 2		12.4					
17	1/0		2/0	2/0	2/0	2/0				14.0					
18	1/0		2/0	2/0	2/0	2/0				14.6					
19	1/0		2/0	2/0	2/0	2/0				13.5					
20	1/0		2/0	2/0	2/0	2/0				14.0					
21	1/0		2/0	2/0	2/0	2/0				14.3					
22	1/0		2/0	2/0	2/0	2/0				13.1					
23	1/0		2/0	2/0	2/0	2/0				13.4					
24	1/0		2/0	2/0	2/0	2/0				12.5					
25	1/0		2/0	2/0	2/0	2/0				11.3					
26	1/0		2/0	2/0	2/0	2/0				12.5					
27	1/0		2/0	2/0	2/0	2/0				12.9					
28	1/0		2/0	2/0	2/0	2/0				12.4					
29	1/0		2/0	2/0	2/0	2/0				12.7					
30	1/0		2/0	2/0	2/0	2/0				12.5					
31	1/0		2/0	2/0	2/0	2/0				14.3					
											13.0				
											14.6				
											11.3				

n.s. = no sample collected/tested



Distribution System Monitoring

WSSN 2310

Jan-14

[illegible]

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Jan-14

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				136			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of December 2013

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION


SIGNATURE OF APPROPRIATE OFFICIAL

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃⁺) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

DEQ
RESOURCE MANAGEMENT DIVISION

JAN 16 2014

LANSING DISTRICT

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909





Coagulation Parameters

WSSN 2310

Dec-13

[illegible]



Flouridation & Chlorination

WSSN 2310

Dec-13

DATE	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well	Tap			
		Free	Free	Free				Free			Free				
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1		0.43					0.8	1.0	0.8	0.8			0.9		
2		0.54					0.9	1.2	0.9	0.8			1.0		
3		0.57					0.7	1.0	0.8	0.8			0.9		
4		0.58					0.9	1.0	0.8	0.7			0.8		
5		0.54					0.7	1.0	0.8	0.8			0.9		
6		0.58					0.9	1.0	0.9	0.8			1.0		
7		0.57					0.9	1.0	0.8	0.8			1.0		
8		0.57					0.7	0.9	0.8	0.8			0.8		
9		0.61					0.9	1.0	0.8	0.8			0.9		
10		0.60					0.9	1.0	0.8	0.8			1.0		
11		0.61					0.9	1.0	0.9	0.9			1.0		
12		0.57					0.8	1.0	0.9	0.8			0.9		
13		0.61					0.9	1.0	0.8	0.9			1.0		
14		n.s.					n.s.	n.s.	n.s.	n.s.			0.9		
15		0.54					0.7	0.9	0.9	0.8			0.9		
16		0.60					0.9	1.0	0.9	0.9			0.9		
17		0.57					0.7	1.0	0.9	0.8			0.9		
18		0.62					0.9	1.0	0.9	0.8			0.9		
19		0.59					0.9	1.0	0.9	0.8			0.9		
20		0.64					1.0	1.0	0.9	0.9			0.9		
21		0.60					0.8	0.9	0.8	0.8			0.8		
22		0.63					0.7	0.9	0.9	0.8			0.9		
23		0.54					0.7	1.0	0.9	0.9			0.9		
24		0.59					0.8	0.9	0.9	0.8			0.9		
25		0.54					0.8	1.0	0.9	0.8			0.9		
26		0.50					0.8	1.0	0.9	0.8			1.0		
27		0.51					0.7	1.0	0.9	0.9			0.9		
28		0.49					0.7	1.0	0.9	0.9			0.9		
29		0.51					0.7	1.0	0.9	0.8			0.8		
30		0.55					0.8	1.0	0.9	0.8			0.9		
31		0.48					0.7	1.0	0.9	0.8			0.9		
AVG		0.56					0.8	1.0	0.9	0.8			0.9		
MAX		0.64					1.0	1.2	0.9	0.9			1.0		
MIN		0.43					0.7	0.9	0.8	0.7			0.8		

n.s. = no sample collected/tested



Chemical Analyses

WSSN 2310

Dec-13

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.36		100		72		28				30.5		5.8		
2		7.29		96		69		27				28.1		6.3		
3		7.30		98		69		29				29.7		5.8		
4		7.40		98		70		28				29.7		5.8		
5		7.35		96		71		25				28.9		5.8		
6		7.33		98		69		29				28.9		6.3		
7		7.34		98		70		28				28.9		6.3		
8		7.29		98		70		28				28.9		6.3		
9		7.36		98		70		28				29.7		5.8		
10		7.36		98		72		26				30.5		5.3		
11		7.40		98		71		27				28.9		6.3		
12		7.36		98		70		28				29.7		5.8		
13		7.38		96		73		23				28.9		5.8		
14		n.s.		n.s.		n.s.		n/a				n.s.		n.s.		
15		7.24		98		71		27				29.7		5.8		
16		7.24		98		69		29				28.9		6.3		
17		7.26		98		68		30				29.7		6.3		
18		7.20		100		70		30				28.9		6.8		
19		7.30		100		70		30				29.7		6.3		
20		7.55		100		71		29				29.7		6.3		
21		7.23		100		68		32				28.9		6.8		
22		7.38		98		73		25				29.7		5.8		
23		7.22		100		72		28				29.7		6.3		
24		7.56		98		72		26				28.9		5.8		
25		7.31		100		73		27				28.9		6.8		
26		7.27		98		72		26				29.7		5.8		
27		7.28		98		65		33				29.7		6.3		
28		7.23		98		69		29				30.5		5.8		
29		7.20		98		73		25				28.9		6.3		
30		7.23		98		69		29				28.9		6.3		
31		7.15		98		73		25				29.7		5.8		
AVG		7.31		98		70		28				29.4		6.1		
MAX		7.56		100		73		33				30.5		6.8		
MIN		7.15		96		65		23				28.1		5.3		

n.s. = no sample collected/tested



Bacteriological & Physical Parameters

WSSN 2310

Dec-13

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap														
	B&P		Dort	3MG Well	Pump	Lab Tap		Raw	Tap			Raw	Tap	Raw	Tap
	60	61	62	63	64	65		66	67			68	69	70	71
1	1/0		2/0	2/0	2/0	2/0					16.2				
2	1/0		2/0	2/0	2/0	2/0					16.0				
3	1/0		2/0	2/0	2/0	2/0					15.3				
4	1/0		2/0	2/0	2/0	2/0					15.9				
5	1/0		2/0	2/0	2/0	2/0					15.3				
6	1/0		2/0	2/0	2/0	2/0					15.5				
7	1/0		2/0	2/0	2/0	2/0					15.2				
8	1/0		2/0	2/0	2/0	2/0					15.1				
9	1/0		2/0	2/0	2/0	2/0					14.7				
10	1/0		2/0	2/0	2/0	2/0					14.6				
11	1/0		2/0	2/0	2/0	2/0					15.2				
12	1/0		2/0	2/0	2/0	2/0			<2		16.6				
13	1/0		2/0	2/0	2/0	2/0					16.7				
14	0/0		0/0	0/0	0/0	2/0					n.s.				
15	1/0		2/0	2/0	2/0	2/0					15.3				
16	1/0		2/0	2/0	2/0	2/0					14.6				
17	1/0		2/0	2/0	2/0	2/0					14.9				
18	1/0		2/0	2/0	2/0	2/0					15.0				
19	1/0		2/0	2/0	2/0	2/0					14.1				
20	1/0		2/0	2/0	2/0	2/0					14.9				
21	1/0		2/0	2/0	2/0	2/0					14.6				
22	1/0		2/0	2/0	2/0	2/0					15.2				
23	1/0		2/0	2/0	2/0	2/0					14.9				
24	1/0		2/0	2/0	2/0	2/0					14.7				
25	1/0		2/0	2/0	2/0	2/0					13.0				
26	1/0		2/0	2/0	2/0	2/0					14.3				
27	1/0		2/0	2/0	2/0	2/0					14.4				
28	1/0		2/0	2/0	2/0	2/0					14.1				
29	1/0		2/0	2/0	2/0	2/0					14.1				
30	1/0		2/0	2/0	2/0	2/0					13.9				
31	1/0		2/0	2/0	2/0	2/0					12.5				
											14.9				
											16.7				
											12.5				

n.s. = no sample collected/tested

Dec-13

[illegible]

Dec-13

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Dec-13

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				130			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of November 2013

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION

Michael Glasgow
SIGNATURE OF APPROPRIATE OFFICIAL

DEQ
RESOURCE MANAGEMENT DIVISION

DEC 18 2013

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

km

Nov-13

[illegible]



Flouridation & Chlorination

WSSN 2310

Nov-13

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well	Tap			
		Free	Free	Free				Free			Free				
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1		0.61					1.0	1.1	0.8	0.8			1.0		
2		0.62					1.0	1.0	0.7	0.8			0.9		
3		0.67					0.7	0.8	0.8	0.8			0.9		
4		0.67					0.9	0.9	0.8	0.8			0.9		
5		0.67					0.9	1.0	0.8	0.8			0.9		
6		0.67					0.8	1.0	0.8	0.8			0.9		
7		0.68					0.8	0.9	0.8	0.8			0.8		
8		0.67					0.9	0.9	0.7	0.8			0.9		
9		0.58					0.7	0.8	0.7	0.8			0.9		
10		0.61					0.7	0.8	0.7	0.6			0.8		
11		0.58					0.9	0.8	0.7	0.7			0.7		
12		0.61					0.7	0.9	0.7	0.7			0.8		
13		0.63					0.9	0.9	0.7	0.7			0.8		
14		0.52					0.7	0.9	0.7	0.6			0.8		
15		0.54					0.9	1.0	0.7	0.8			0.9		
16		0.53					0.7	0.8	0.7	0.7			0.8		
17		0.60					0.7	0.9	0.7	0.7			0.8		
18		0.62					0.9	0.9	0.8	0.8			0.9		
19		0.69					0.8	1.0	0.7	0.8			0.9		
20		0.59					0.8	0.9	0.8	0.7			0.9		
21		0.59					0.8	0.9	0.8	0.7			0.8		
22		0.60					0.9	1.0	0.8	0.8			1.0		
23		0.55					0.7	0.8	0.7	0.7			0.9		
24		0.56					0.7	0.9	0.7	0.7			0.8		
25		0.61					0.8	0.9	0.8	0.8			0.8		
26		0.58					0.7	1.0	0.8	0.7			0.8		
27		0.55					0.9	0.9	0.8	0.8			0.9		
28		0.50					0.7	0.9	0.8	0.8			0.9		
29		0.52					0.7	0.9	0.8	0.7			0.9		
30		0.53					0.8	0.9	0.8	0.7			0.8		
AVG		0.60					0.8	0.9	0.8	0.7			0.9		
MAX		0.69					1.0	1.1	0.8	0.8			1.0		
MIN		0.50					0.7	0.8	0.7	0.6			0.7		



Chemical Analyses

WSSN 2310

Nov-13

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.22		100		73		27				28.9		6.8		
2		7.34		98		71		27				27.3		7.3		
3		7.27		98		69		29				28.9		6.3		
4		7.23		98		72		26				28.9		6.3		
5		7.26		96		71		25				28.9		5.8		
6		7.30		96		73		23				30.5		4.9		
7		7.32		100		70		30				29.7		6.3		
8		7.35		98		70		28				28.9		6.3		
9		7.50		98		74		24				28.1		6.8		
10		7.42		96		68		28				28.9		5.8		
11		7.40		100		69		31				28.9		6.8		
12		7.36		98		74		24				28.9		6.3		
13		7.41		98		71		27				29.7		5.8		
14		7.38		100		70		30				29.7		6.3		
15		7.30		100		69		31				28.1		7.3		
16		7.32		98		68		30				30.5		5.3		
17		7.29		98		66		32				29.7		5.8		
18		7.33		98		74		24				28.9		6.3		
19		7.34		96		72		24				30.5		4.9		
20		7.43		98		71		27				29.7		5.8		
21		7.47		100		67		33				29.7		6.3		
22		7.29		98		71		27				28.9		6.3		
23		7.33		94		72		22				29.7		4.9		
24		7.40		100		71		29				29.7		6.3		
25		7.44		98		73		25				29.7		5.8		
26		7.41		98		68		30				29.7		5.8		
27		7.36		98		69		29				28.9		6.3		
28		7.29		100		73		27				28.9		6.3		
29		7.32		100		74		26				29.7		6.3		
30		7.38		98		72		26				28.9		6.3		
AVG		7.35		98		71		27				29.2		6.1		
MAX		7.50		100		74		33				30.5		7.3		
MIN		7.22		94		66		22				27.3		4.9		



Bacteriological & Physical Parameters

WSSN 2310

Nov-13

DATE	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap											Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Sta II	Lab Tap									
	60	61	62	63	64	65		66	67			68	69	70	71
1	1/0		2/0	2/0	2/0	2/0					14.5				
2	1/0		2/0	2/0	2/0	2/0					14.1				
3	1/0		2/0	2/0	2/0	2/0					16.3				
4	1/0		2/0	2/0	2/0	2/0					13.5				
5	1/0		2/0	2/0	2/0	2/0					13.7				
6	1/0		2/0	2/0	2/0	2/0					13.5				
7	1/0		2/0	2/0	2/0	2/0					16.7				
8	1/0		2/0	2/0	2/0	2/0					17.0				
9	1/0		2/0	2/0	2/0	2/0					17.4				
10	1/0		2/0	2/0	2/0	2/0					17.6				
11	1/0		2/0	2/0	2/0	2/0					17.6				
12	1/0		2/0	2/0	2/0	2/0					17.7				
13	1/0		2/0	2/0	2/0	2/0					17.4				
14	1/0		2/0	2/0	2/0	2/0					18.1				
15	1/0		2/0	2/0	2/1	2/0					18.5				
16	1/0		2/0	2/0	2/0	2/0					17.2				
17	1/0		2/0	2/0	2/0	2/0					19.3				
18	1/0		2/0	2/0	2/0	2/0					18.9				
19	1/0		2/0	2/0	2/0	2/0					18.8				
20	1/0		2/0	2/0	2/0	2/0					19.1				
21	1/0		2/0	2/0	2/0	2/0					16.9				
22	1/0		2/0	2/0	2/0	2/0					18.1				
23	1/0		2/0	2/0	2/0	2/0					16.4				
24	1/0		2/0	2/0	2/0	2/0					16.9				
25	1/0		2/0	2/0	2/0	2/0					16.3				
26	1/0		2/0	2/0	2/0	2/0					15.4				
27	1/0		2/0	2/0	2/0	2/0					15.3				
28	1/0		2/0	2/0	2/0	2/0					15.6				
29	1/0		2/0	2/0	2/0	2/0					15.9				
30	1/0		2/0	2/0	2/0	2/0					15.5				
											16.6				
											19.3				
											13.5				



Distribution System Monitoring

WSSN 2310

Nov-13

[illegible]

Nov-13

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Nov-13

Total number of positive routine samples:				Total Coliform: <u>1</u>		Fecal Coliform:	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
11/15/2013	Control Station # 2 (Sta II)	Present	Absent	11/16/2013	Control Station # 2 (Sta II)	Absent	Absent
				11/16/2013	Baxter & Potter Rd.	Absent	Absent
				11/16/2013	Control Station # 5 (Dort Well)	Absent	Absent
Total number of routine distribution samples analyzed:				146			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of October 2013

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION

Michael Glasgow
SIGNATURE OF APPROPRIATE OFFICIAL

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃⁺) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

NOV 12 2013
LANSING DISTRICT

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MP

Oct-13

[illegible]

**Flouridation & Chlorination****WSSN 2310****Oct-13**

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
		Raw	Tap	Dist		Chlorine (prior to filtration) mg/L OCI-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well			Tap	
								Free	Free	Free	Free			Free	
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.64					0.7	0.8	0.7	0.7			0.8	
2			0.64					0.8	0.8	0.7	0.7			0.7	
3			0.66					0.7	0.9	0.7	0.6			0.8	
4			0.66					0.8	0.8	0.7	0.6			0.8	
5			0.71					0.8	0.8	0.7	0.7			0.8	
6			0.70					0.8	0.9	0.7	0.6			0.8	
7			0.69					0.9	0.9	0.7	0.7			0.8	
8			0.74					0.8	0.9	0.7	0.6			0.9	
9			0.75					0.9	0.9	0.7	0.7			0.8	
10			0.72					0.8	0.9	0.7	0.7			0.8	
11			0.75					0.8	0.9	0.8	0.7			0.9	
12			0.74					0.8	0.8	0.8	0.7			0.8	
13			0.63					0.8	0.9	0.7	0.7			0.8	
14			0.73					0.8	0.8	0.7	0.7			0.8	
15			0.74					0.7	0.9	0.7	0.6			0.8	
16			0.78					0.9	0.9	0.7	0.6			0.8	
17			0.79					0.8	0.9	0.7	0.6			0.9	
18			0.81					0.9	0.9	0.7	0.6			0.8	
19			0.77					0.9	0.8	0.7	0.7			0.8	
20			n.s					n.s	n.s	n.s	n.s			n.s	
21			0.73					0.9	1.0	0.7	0.7			0.9	
22			0.70					0.9	0.9	0.8	0.7			0.9	
23			0.67					0.9	1.0	0.6	0.7			0.9	
24			0.68					0.9	0.9	0.8	0.7			0.9	
25			0.70					0.8	1.0	0.7	0.7			0.9	
26			0.64					0.9	0.9	0.8	0.7			0.8	
27			0.60					0.7	0.8	0.7	0.7			0.8	
28			0.59					0.9	0.9	0.7	0.7			0.8	
29			0.66					0.8	0.9	0.7	0.6			0.8	
30			0.65					0.9	0.9	0.8	0.7			0.9	
31			0.60					0.6	0.9	0.7	0.7			0.9	
AVG			0.70					0.8	0.9	0.7	0.7			0.8	
MAX			0.81					0.9	1.0	0.8	0.7			0.9	
MIN			0.59					0.6	0.8	0.6	0.6			0.7	

n.s. = no sample collected/tested



Chemical Analyses

WSSN 2310

Oct-13

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.36		98		74		24				28.9		6.3		
2		7.51		98		71		27				28.1		6.8		
3		7.32		98		73		25				28.9		6.3		
4		7.31		100		73		27				30.5		5.8		
5		7.44		98		75		23				28.9		6.3		
6		7.37		98		71		27				28.1		6.8		
7		7.43		98		71		27				28.9		6.3		
8		7.40		98		70		28				28.9		6.3		
9		7.43		98		73		25				28.9		6.3		
10		7.43		98		71		27				28.9		6.3		
11		7.35		100		74		26				30.5		5.8		
12		7.36		100		73		27				29.7		6.3		
13		7.28		98		71		27				28.1		6.8		
14		7.34		98		70		28				28.9		6.3		
15		7.47		98		73		25				28.1		6.8		
16		7.41		100		71		29				28.9		6.8		
17		7.38		98		65		33				28.9		6.3		
18		7.34		98		68		30				28.9		6.3		
19		7.41		96		65		31				27.3		6.8		
20		n.s.		n.s.		n.s.		n.s.				n.s.		n.s.		
21		7.46		96		68		28				29.7		5.3		
22		7.36		96		71		25				28.9		5.8		
23		7.29		96		70		26				28.9		5.8		
24		7.37		98		72		26				28.9		6.3		
25		7.31		98		71		27				28.9		6.3		
26		7.22		96		69		27				28.9		5.8		
27		7.28		98		71		27				28.9		6.3		
28		7.35		98		68		30				28.9		6.3		
29		7.36		98		70		28				28.9		6.3		
30		7.27		100		71		29				29.7		6.3		
31		7.30		98		70		28				29.7		6.3		
AVG		7.36		98		71		27				29.0		6.3		
MAX		7.51		100		75		33				30.5		6.8		
MIN		7.22		96		65		23				27.3		5.3		

n.s. = no sample collected/tested

**Bacteriological & Physical Parameters****WSSN 2310****Oct-13**

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Pump	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					19.4				
2	1/0		2/0	2/0	2/0	2/0					19.4				
3	1/0		2/0	2/0	2/0	2/0					19.4				
4	1/0		2/0	2/0	2/0	2/0					20.9				
5	1/0		2/0	2/0	2/0	2/0					19.7				
6	1/0		2/0	2/0	2/0	2/0					19.6				
7	1/0		2/0	2/0	2/0	2/0					19.4				
8	1/0		2/0	2/0	2/0	2/0					19.3				
9	1/0		2/0	2/0	2/0	2/0					19.1				
10	1/0		2/0	2/0	2/0	2/0					18.2				
11	1/0		2/0	2/0	2/0	2/0					18.2				
12	1/0		2/0	2/0	2/0	2/0					18.4				
13	1/0		2/0	2/0	2/0	2/0					18.2				
14	1/0		2/0	2/0	2/0	2/0					18.8				
15	1/0		2/0	2/0	2/0	2/0					18.8				
16	1/0		2/0	2/0	2/0	2/0					18.5				
17	1/0		2/0	2/0	2/0	2/0			< 2		18.5				
18	1/0		2/0	2/0	2/0	2/0					18.5				
19	1/0		2/0	2/0	2/0	2/0					17.8				
20	0/0		0/0	0/0	0/0	0/0					n.s.				
21	1/0		2/0	2/0	2/0	2/0					17.7				
22	1/0		2/0	2/0	2/0	2/0					16.9				
23	1/0		2/0	2/0	2/0	2/0					16.7				
24	1/0		2/0	2/0	2/0	2/0					15.7				
25	1/0		2/0	2/0	2/0	2/0					14.9				
26	1/0		2/0	2/0	2/0	2/0					15.5				
27	1/0		2/0	2/0	2/0	2/0					14.8				
28	1/0		2/0	2/0	2/0	2/0					15.0				
29	1/0		2/0	2/0	2/0	2/0					15.9				
30	1/0		2/0	2/0	2/0	2/0					14.4				
31	1/0		2/0	2/0	2/0	2/0					14.8				
											17.7				
											20.9				
											14.4				

n.s. = no sample collected/tested



Distribution System Monitoring

WSSN 2310

Oct-13

[illegible]



Distribution System Monitoring WSSN 2310 Oct-13

[illegible]

Oct-13

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				157			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of September 2013

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION

Michael Glasgow
SIGNATURE OF APPROPRIATE OFFICIAL

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

RECEIVED
OCT 14 2013
LANSING DISTRICT

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

Sep-13

[illegible]



Flouridation & Chlorination

WSSN 2310

Sep-13

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCI-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well		Tap		
		Free	Free	Free				Free			Free				
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.64					0.8	0.9	0.8	0.7			0.8	
2			0.64					0.9	0.9	0.7	0.8			0.8	
3			0.66					0.8	0.9	0.7	0.7			0.9	
4			0.67					0.9	0.9	0.7	0.7			0.9	
5			0.63					0.6	0.9	0.7	0.7			0.9	
6			0.68					0.8	0.9	0.7	0.6			1.0	
7			0.62					n.s.	n.t.	n.t.	n.t.			n.t.	
8			0.64					0.7	0.9	0.7	0.6			0.8	
9			0.64					0.8	0.8	0.7	0.6			0.7	
10			0.65					n.s.	1.0	0.6	0.6			0.9	
11			0.66					0.9	0.9	0.7	0.6			0.8	
12			0.65					0.9	0.9	0.7	0.7			0.8	
13			0.64					1.0	0.9	0.7	0.6			0.8	
14			0.61					0.7	0.8	0.7	0.7			0.9	
15			0.69					0.7	0.9	0.7	0.6			0.8	
16			0.66					0.8	0.9	0.7	0.7			0.9	
17			0.65					0.7	0.9	0.7	0.7			0.9	
18			0.65					0.8	0.9	0.8	0.7			0.9	
19			0.71					0.7	0.9	0.6	0.7			0.9	
20			0.69					0.9	0.9	0.7	0.7			0.9	
21			0.63					0.9	1.0	0.6	0.6			0.9	
22			0.67					0.7	0.9	0.7	0.6			0.8	
23			0.69					0.9	0.8	0.7	0.7			0.8	
24			0.71					0.8	0.9	0.7	0.7			0.9	
25			0.66					0.8	0.9	0.7	0.7			0.8	
26			0.69					0.7	0.9	0.7	0.7			0.9	
27			0.72					0.7	0.9	0.7	0.6			0.9	
28			0.60					0.9	0.9	0.7	0.7			0.8	
29			0.59					0.9	1.0	0.7	0.7			0.9	
30			0.57					0.9	1.0	0.7	0.7			0.8	
AVG			0.65					0.8	0.9	0.7	0.7			0.9	
MAX			0.72					1.0	1.0	0.8	0.8			1.0	
MIN			0.57					0.6	0.8	0.6	0.6			0.7	

n.t. = not tested, n.s. = no sample collected



Chemical Analyses

WSSN 2310

Sep-13

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.22		100		72		28				28.9		6.8		
2		7.27		98		70		28				28.1		6.8		
3		7.30		98		68		30				28.1		6.3		
4		7.33		98		69		29				28.9		6.3		
5		7.34		98		69		29				28.9		6.3		
6		7.42		98		74		24				28.9		6.3		
7		n.t		100		70		30				28.9		6.8		
8		7.45		100		68		32				28.9		6.8		
9		7.43		96		70		26				28.1		6.3		
10		7.42		100		73		27				29.7		6.3		
11		7.39		98		71		27				28.9		6.3		
12		7.47		98		70		28				29.7		5.8		
13		7.29		94		69		25				28.1		5.8		
14		7.33		94		75		19				26.5		6.8		
15		7.28		98		73		25				28.9		6.3		
16		7.39		98		69		29				28.9		6.3		
17		7.45		98		69		29				28.9		6.3		
18		7.38		98		73		25				28.1		6.8		
19		7.36		98		74		24				29.7		5.8		
20		7.35		98		72		26				29.7		5.9		
21		7.45		98		73		25				29.7		5.8		
22		7.40		96		73		23				29.7		5.3		
23		7.39		98		73		25				30.5		5.3		
24		7.38		98		73		25				29.7		5.8		
25		7.44		98		67		31				28.9		6.3		
26		7.42		100		68		32				29.7		6.3		
27		7.44		98		68		30				28.9		6.3		
28		7.47		98		69		29				29.7		5.8		
29		7.31		100		72		28				29.7		6.3		
30		7.30		96		69		27				28.1		6.3		
AVG		7.37		98		71		27				29.0		6.2		
MAX		7.47		100		75		32				30.5		6.8		
MIN		7.22		94		67		19				26.5		5.3		

n.t. = not tested

**Bacteriological & Physical Parameters****WSSN 2310****Sep-13**

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Pump	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					23.3				
2	1/0		2/0	2/0	2/0	2/0					21.6				
3	1/0		2/0	2/0	2/0	2/0					21.1				
4	1/0		2/0	2/0	2/0	2/0					21.9				
5	1/0		2/0	2/0	2/0	2/0					22.0				
6	1/0		2/0	2/0	2/0	2/0					21.8				
7	0/0		1/0	1/0	1/0	1/0					n.t.				
8	1/0		2/0	2/0	2/0	2/0					21.8				
9	1/0		2/0	2/0	2/0	2/0					22.2				
10	0/0		2/0	2/0	2/0	2/0					22.1				
11	1/0		2/0	2/0	2/0	2/0					22.3				
12	1/0		2/0	2/0	2/0	2/0					22.4				
13	1/0		2/0	2/0	2/0	2/0					21.4				
14	1/0		2/0	2/0	2/0	2/0					19.1				
15	1/0		2/0	2/0	2/0	2/0					21.1				
16	1/0		2/0	2/0	2/0	2/0					20.8				
17	1/0		2/0	2/0	2/0	2/0					20.1				
18	1/0		2/0	2/0	2/0	2/0					21.0				
19	1/0		2/0	2/0	2/0	2/0					20.9				
20	1/0		2/0	2/0	2/0	2/0					20.7				
21	1/0		2/0	2/0	2/0	2/0					20.3				
22	1/0		2/0	2/0	2/0	2/0					19.5				
23	1/0		2/0	2/0	2/0	2/0					19.3				
24	1/0		2/0	2/0	2/0	2/0					19.8				
25	1/0		2/0	2/0	2/0	2/0					19.6				
26	1/0		2/0	2/0	2/0	2/0					19.6				
27	1/0		2/0	2/0	2/0	2/0					19.3				
28	1/0		2/0	2/0	2/0	2/0					19.4				
29	1/0		2/0	2/0	2/0	2/0					19.7				
30	1/0		2/0	2/0	2/0	2/0					19.5				
											20.8				
											23.3				
											19.1				

n.t. = not tested



Distribution System Monitoring

WSSN 2310

Sep-13

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Sept-13

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				124			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of August 2013

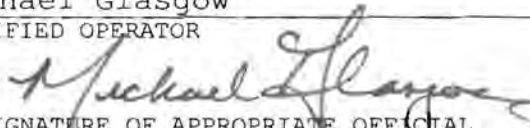
Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION


SIGNATURE OF APPROPRIATE OFFICIAL

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

DEQ
RESOURCE MANAGEMENT DIVISION

SEP 17 2013

LANSING DISTRICT

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MS



Coagulation Parameters

WSSN 2310

Aug-13

[illegible]



Flouridation & Chlorination

WSSN 2310

Aug-13

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well	Tap			
		Free	Free	Free				Free			Free				
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.63				0.8	1.0	0.7	0.7			1.0		
2			0.64				0.9	1.1	0.9	0.8			1.1		
3			0.62				0.9	1.0	0.9	0.7			0.9		
4			0.64				1.0	1.0	0.8	0.7			1.0		
5			0.64				1.0	1.0	0.9	0.8			1.0		
6			0.63				0.9	1.0	0.9	0.8			1.0		
7			0.65				0.9	1.0	0.8	0.8			0.9		
8			0.60				0.8	1.0	0.8	0.8			0.9		
9			0.64				0.9	1.0	0.9	0.9			1.0		
10			0.64				0.9	1.0	0.9	0.9			0.9		
11			0.61				0.8	0.9	0.8	0.8			0.8		
12			0.58				0.9	0.9	0.8	0.7			0.8		
13			0.61				0.7	0.8	0.8	0.7			0.8		
14			0.64				0.9	0.8	0.8	0.6			0.8		
15			0.58				0.7	0.9	0.7	0.7			0.8		
16			0.64				0.9	0.9	0.7	0.7			0.9		
17			0.59				0.7	0.9	0.8	0.8			0.9		
18			0.59				0.8	0.9	0.7	0.7			0.8		
19			0.60				0.9	0.9	0.8	0.7			0.8		
20			0.60				0.9	0.9	0.8	0.7			0.9		
21			0.61				0.9	0.9	0.8	0.7			0.7		
22			0.61				0.9	0.9	0.7	0.7			0.9		
23			0.55				0.7	1.0	0.8	0.7			1.0		
24			0.51				0.8	0.9	0.8	0.7			0.8		
25			0.55				0.8	0.9	0.8	0.7			0.7		
26			0.55				0.9	0.9	0.7	0.7			0.8		
27			0.58				0.8	0.9	0.7	0.7			0.8		
28			0.57				0.9	0.9	0.8	0.7			0.8		
29			0.57				0.7	0.9	0.7	0.7			0.8		
30			0.60				0.9	0.9	0.8	0.7			0.8		
31			0.63				0.9	0.9	0.7	0.7			0.9		
AVG			0.60				0.9	0.9	0.8	0.7			0.9		
MAX			0.65				1.0	1.1	0.9	0.9			1.1		
MIN			0.51				0.7	0.8	0.7	0.6			0.7		



Chemical Analyses

WSSN 2310

Aug-13

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.44		98		71		27				28.9		6.3		
2		7.34		98		73		25				29.7		5.8		
3		7.26		98		72		26				28.9		6.3		
4		n/a		100		75		25				28.9		6.8		
5		7.37		98		72		26				28.9		6.3		
6		7.42		96		72		24				28.1		6.3		
7		7.37		98		70		28				28.9		6.3		
8		7.28		98		71		27				28.1		6.8		
9		7.35		96		72		24				28.9		5.8		
10		7.29		96		69		27				28.1		6.3		
11		7.30		98		74		24				29.7		5.8		
12		7.28		98		69		29				28.9		6.3		
13		7.35		98		74		24				28.9		6.3		
14		7.39		100		73		27				28.9		6.8		
15		7.44		98		71		27				29.7		6.3		
16		7.44		96		73		23				28.9		5.8		
17		7.37		98		66		32				29.7		5.8		
18		7.32		98		72		26				28.9		6.3		
19		7.37		98		67		31				28.9		6.3		
20		7.35		100		74		26				28.1		7.3		
21		7.29		98		67		31				28.9		6.3		
22		7.29		98		67		31				28.1		6.8		
23		7.45		98		72		26				28.9		6.3		
24		7.29		98		74		24				28.9		6.3		
25		7.29		96		67		29				28.9		5.8		
26		7.39		100		74		26				28.9		6.8		
27		7.40		98		74		24				28.1		6.8		
28		7.37		98		70		28				28.9		6.3		
29		7.40		96		71		25				28.9		5.8		
30		7.30		98		73		25				28.9		6.3		
31		7.36		96		73		23				28.9		5.8		
AVG		7.35		98		71		26				28.8		6.3		
MAX		7.45		100		75		32				29.7		7.3		
MIN		7.26		96		66		23				28.1		5.8		



Bacteriological & Physical Parameters

WSSN 2310

Aug-13

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Pump	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					19.8				
2	1/0		2/0	2/0	2/0	2/0					19.4				
3	1/0		2/0	2/0	2/0	2/0					20.7				
4	1/0		2/0	2/0	2/0	2/0					n/a				
5	1/0		2/0	2/0	2/0	2/0					19.8				
6	1/0		2/0	2/0	2/0	2/0					19.9				
7	1/0		2/0	2/0	2/0	2/0					20.4				
8	1/0		2/0	2/0	2/0	2/0					20.6				
9	1/0		2/0	2/0	2/0	2/0					20.2				
10	1/0		2/0	2/0	2/0	2/0					21.2				
11	1/0		2/0	2/0	2/0	2/0					20.5				
12	1/0		2/0	2/0	2/0	2/0					20.3				
13	1/0		2/0	2/0	2/0	2/0					20.3				
14	1/0		2/0	2/0	2/0	2/0			< 2		20.2				
15	1/0		2/0	2/0	2/0	2/0					20.6				
16	1/0		2/0	2/0	2/0	2/0					20.8				
17	1/0		2/0	2/0	2/0	2/0					20.8				
18	1/0		2/0	2/0	2/0	2/0					21.0				
19	1/0		2/0	2/0	2/0	2/0					20.7				
20	1/0		2/0	2/0	2/0	2/0					24.1				
21	1/0		2/0	2/0	2/0	2/0					20.9				
22	1/0		2/0	2/0	2/0	2/0					20.8				
23	1/0		2/0	2/0	2/0	2/0					20.8				
24	1/0		2/0	2/0	2/0	2/0					21.1				
25	1/0		2/0	2/0	2/0	2/0					21.0				
26	1/0		2/0	2/0	2/0	2/0					22.8				
27	1/0		2/0	2/0	2/0	2/0					21.7				
28	1/0		2/0	2/0	2/0	2/0					21.6				
29	1/0		2/0	2/0	2/0	2/0					21.3				
30	1/0		2/0	2/0	2/0	2/0					21.0				
31	1/0		2/0	2/0	2/0	2/0					21.4				
											20.9				
											24.1				
											19.4				



Distribution System Monitoring

WSSN 2310

Aug-13

[illegible]



Distribution System Monitoring WSSN 2310

Aug-13

[illegible]

Aug-13

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				150			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of July 2013

 ENTERED

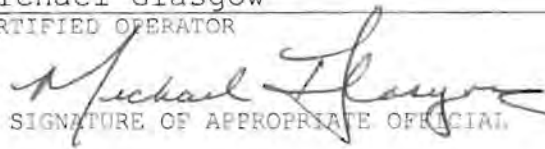
Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION


SIGNATURE OF APPROPRIATE OFFICIAL

DEQ
RESOURCE MANAGEMENT DIVISION

AUG 15 2013

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MP

Jul-13

[illegible]



Flouridation & Chlorination

WSSN 2310

Jul-13

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCI-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well			Tap	
		Raw	Tap	Dist				Free	Free	Free	Free			Free	
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.60					0.7	0.8	0.7	0.6			0.80	
2			0.59					0.7	0.8	0.7	0.7			0.80	
3			0.62					0.7	0.8	0.6	0.6			0.70	
4			0.58					0.7	0.7	0.6	0.6			0.70	
5			0.61					0.6	0.7	0.5	0.5			0.80	
6			0.60					0.6	0.6	0.5	0.5			0.60	
7			0.59					0.7	0.8	0.6	0.5			0.70	
8			0.66					0.7	0.9	0.5	0.6			0.80	
9			0.64					0.8	0.9	0.6	0.5			0.80	
10			0.65					0.8	0.9	0.6	0.6			0.90	
11			0.62					0.9	0.8	0.6	0.7			0.80	
12			0.65					0.8	0.8	0.8	0.7			0.90	
13			0.62					0.9	0.9	0.7	0.7			0.80	
14			0.61					0.8	0.9	0.7	0.7			0.80	
15			0.60					0.8	0.9	0.7	0.7			0.80	
16			0.62					0.8	0.9	0.7	0.7			0.90	
17			0.63					0.9	0.9	0.7	0.6			0.90	
18			0.62					0.7	1.0	0.8	0.7			1.00	
19			0.62					0.9	1.0	0.8	0.8			1.00	
20			0.59					0.8	1.0	0.8	0.8			0.90	
21			0.61					0.9	1.0	0.8	0.8			0.90	
22			0.59					1.0	1.1	0.8	0.8			1.10	
23			0.63					0.8	1.1	0.8	0.8			1.00	
24			0.63					0.9	0.9	0.9	0.9			0.90	
25			0.66					0.8	0.9	0.8	0.8			0.80	
26			0.63					0.9	0.9	0.8	0.8			0.90	
27			0.62					0.8	0.9	0.8	0.8			0.90	
28			0.66					0.7	0.9	0.7	0.7			1.00	
29			0.64					0.8	0.9	0.7	0.7			0.90	
30			0.65					0.9	0.9	0.8	0.7			0.90	
31			0.62					0.9	0.9	0.8	0.7			0.90	
AVG			0.62					0.8	0.9	0.7	0.7			0.9	
MAX			0.66					1.0	1.1	0.9	0.9			1.1	
MIN			0.58					0.6	0.6	0.5	0.5			0.6	



Chemical Analyses

WSSN 2310

Jul-13

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.35		100		70		30				29.7		6.3		
2		7.38		98		72		26				29.4		5.8		
3		7.36		98		72		26				28.9		6.3		
4		7.32		98		73		25				28.9		6.3		
5		7.39		106		69		37				27.3		9.2		
6		7.42		98		70		28				27.3		7.3		
7		7.42		98		71		27				28.9		6.3		
8		7.32		96		71		25				28.9		5.8		
9		7.41		100		71		29				28.9		6.8		
10		7.38		98		72		26				28.1		6.8		
11		7.45		98		70		28				28.9		6.3		
12		7.39		96		72		24				28.9		5.8		
13		7.44		96		72		24				28.9		5.8		
14		7.42		98		73		25				30.5		5.3		
15		7.36		96		70		26				28.9		5.8		
16		7.40		96		71		25				28.9		5.8		
17		7.37		100		69		31				28.9		6.8		
18		7.44		98		73		25				28.9		6.3		
19		7.37		100		71		29				28.1		7.3		
20		7.40		98		71		27				28.9		6.3		
21		7.42		98		74		24				28.9		6.3		
22		7.39		100		68		32				28.9		6.8		
23		7.40		98		71		27				28.9		6.3		
24		7.42		100		72		28				29.7		6.3		
25		7.45		96		74		22				28.9		5.8		
26		7.43		96		69		27				32.1		3.9		
27		7.38		98		70		28				29.7		5.8		
28		7.30		98		71		27				28.9		6.3		
29		7.58		100		73		27				28.9		6.8		
30		7.41		100		69		31				29.7		6.3		
31		7.37		98		70		28				28.9		6.3		
AVG		7.40		98		71		27				29.0		6.3		
MAX		7.58		106		74		37				32.1		9.2		
MIN		7.30		96		68		22				27.3		3.9		



Bacteriological & Physical Parameters

WSSN 2310

Jul-13

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Pump	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					17.7				
2	1/0		2/0	2/0	2/0	2/0					17.9				
3	1/0		2/0	2/0	2/0	2/0					17.8				
4	1/0		2/0	2/0	2/0	2/0					18.7				
5	1/0		2/0	2/0	2/0	2/0					19.0				
6	1/0		2/0	2/0	2/0	2/0					19.4				
7	1/0		2/0	2/0	2/0	2/0					19.8				
8	1/0		2/0	2/0	2/0	2/0					20.3				
9	1/0		2/0	2/0	2/0	2/0					19.7				
10	1/0		2/0	2/0	2/0	2/0					21.1				
11	1/0		2/0	2/0	2/0	2/0					20.6				
12	1/0		2/0	2/0	2/0	2/0					20.5				
13	1/0		2/0	2/0	2/0	2/0					19.8				
14	1/0		2/0	2/0	2/0	2/0					20.3				
15	1/0		2/0	2/0	2/0	2/0					21.6				
16	1/0		2/0	2/0	2/0	2/0					22.3				
17	1/0		2/0	2/0	2/0	2/0					22.9				
18	1/0		2/0	2/0	2/0	2/0					23.2				
19	1/0		2/0	2/0	2/0	2/0					22.8				
20	1/0		2/0	2/0	2/0	2/0					21.2				
21	1/0		2/0	2/0	2/0	2/0					22.1				
22	1/0		2/0	2/0	2/0	2/0					21.7				
23	1/0		2/0	2/0	2/0	2/0					20.9				
24	1/0		2/0	2/0	2/0	2/0					21.1				
25	1/0		2/0	2/0	2/0	2/0					20.2				
26	1/0		2/0	2/0	2/0	2/0					19.9				
27	1/0		2/0	2/0	2/0	2/0					20.8				
28	1/0		2/0	2/0	2/0	2/0					20.5				
29	1/0		2/0	2/0	2/0	2/0			<2		20.4				
30	1/0		2/0	2/0	2/0	2/0					20.4				
31	1/0		2/0	2/0	2/0	2/0					20.6				
											20.5				
											23.2				
											17.7				



Distribution System Monitoring

WSSN 2310

Jul-13

[illegible]

Jul-13

[illegible]

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

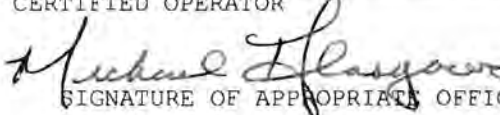
 ENTERED
For Month of June 2013
Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION


SIGNATURE OF APPROPRIATE OFFICIAL

 DEQ
RESOURCE MONITORING DIVISION

JUL 1 2013

LANSING DISTRICT

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:
 Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909



Jun-13

[illegible]



Flouridation & Chlorination

WSSN 2310

Jun-13

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well	Tap			
		Free	Free	Free				Free			Free				
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.55					0.7	0.9	0.7	0.8			0.8	
2			0.50					0.8	0.9	0.8	0.7			0.9	
3			0.55					0.9	1.1	0.9	0.8			0.9	
4			0.55					0.9	1.0	0.8	0.8			1.0	
5			0.52					0.9	1.0	0.9	0.8			1.0	
6			0.48					0.8	1.0	0.8	0.7			0.8	
7			0.54					0.9	1.0	0.9	0.9			1.0	
8			0.56					0.9	0.9	0.9	0.9			0.9	
9			0.54					0.7	1.0	0.9	0.8			0.9	
10			0.55					0.8	1.0	0.8	0.8			0.9	
11			0.54					0.8	1.0	0.9	0.8			0.8	
12			0.58					0.8	0.9	0.8	0.8			0.8	
13			0.55					0.7	0.9	0.8	0.8			0.8	
14			0.56					0.8	0.8	0.8	0.7			0.8	
15			0.55					0.9	1.0	0.7	0.7			1.0	
16			0.56					0.8	0.9	0.9	0.8			1.0	
17			0.54					0.8	0.9	0.8	0.7			0.8	
18			0.55					0.8	0.9	0.8	0.8			0.8	
19			0.57					0.9	0.9	0.8	0.7			0.8	
20			0.57					0.7	0.9	0.8	0.7			0.8	
21			0.60					0.7	0.8	0.7	0.7			0.8	
22			0.61					0.9	0.8	0.7	0.7			0.8	
23			0.60					0.7	0.8	0.7	0.6			0.8	
24			0.58					0.8	0.9	0.7	0.7			0.8	
25			0.55					0.7	0.8	0.6	0.5			0.8	
26			0.60					0.8	0.9	0.6	0.5			0.8	
27			0.53					0.9	0.9	0.7	0.6			0.9	
28			0.57					0.7	0.9	0.7	0.7			0.9	
29			0.61					0.8	0.8	0.7	0.7			0.8	
30			0.59					0.8	0.8	0.7	0.7			0.7	
AVG			0.56					0.8	0.9	0.8	0.7			0.9	
MAX			0.61					0.9	1.1	0.9	0.9			1.0	
MIN			0.48					0.7	0.8	0.6	0.5			0.7	



Chemical Analyses

WSSN 2310

Jun-13

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.22		98		73		25				28.1		6.8		
2		7.36		96		71		25				28.1		6.3		
3		7.34		96		70		26				28.1		6.8		
4		7.34		98		73		25				29.7		5.8		
5		7.39		96		72		24				32.9		3.4		
6		7.50		98		68		30				29.7		5.8		
7		7.33		98		68		30				32.1		4.4		
8		7.40		98		66		32				30.5		5.3		
9		7.24		98		69		29				28.9		6.3		
10		7.36		98		69		29				28.9		6.3		
11		7.42		98		71		27				28.9		6.3		
12		7.50		98		72		26				29.7		5.8		
13		7.38		98		72		26				29.7		5.8		
14		7.35		98		72		26				26.5		7.8		
15		7.38		96		72		24				27.3		5.3		
16		7.43		102		72		30				32.1		5.3		
17		7.42		98		72		26				28.9		6.3		
18		7.43		98		69		29				28.9		6.3		
19		7.37		98		72		26				28.9		6.3		
20		7.45		98		72		26				29.7		5.8		
21		7.35		96		74		22				29.7		5.3		
22		7.41		100		73		27				29.7		6.3		
23		7.39		98		70		28				28.9		6.3		
24		7.40		98		69		29				28.9		6.3		
25		7.36		98		74		24				28.9		6.3		
26		7.49		98		74		24				28.9		6.3		
27		7.38		98		73		25				28.9		6.3		
28		7.32		98		69		29				28.9		6.3		
29		7.34		98		74		24				29.7		5.8		
30		7.38		98		70		28				28.9		6.3		
AVG		7.38		98		71		27				29.3		6.0		
MAX		7.50		102		74		32				32.9		7.8		
MIN		7.22		96		66		22				26.5		3.4		



Bacteriological & Physical Parameters

WSSN 2310

Jun-13

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Pump	Lab Tap									
	60	61	62	63	64	65						66	67	68	69
1	1/0		2/0	2/0	2/0	2/0					14.6				
2	1/0		2/0	2/0	2/0	2/0					14.0				
3	1/0		2/0	2/0	2/0	2/0					13.4				
4	1/0		2/0	2/0	2/0	2/0					13.4				
5	1/0		2/0	2/0	2/0	2/0					12.8				
6	1/0		2/0	2/0	2/0	2/0			< 2		13.6				
7	1/0		2/0	2/0	2/0	2/0					14.0				
8	1/0		2/0	2/0	2/0	2/0					14.5				
9	1/0		2/0	2/0	2/0	2/0					14.6				
10	1/0		2/0	2/0	2/0	2/0					15.5				
11	1/0		2/0	2/0	2/0	2/0					16.2				
12	1/0		2/0	2/0	2/0	2/0					16.3				
13	1/0		2/0	2/0	2/0	2/0					16.2				
14	1/0		2/0	2/0	2/0	2/0					15.7				
15	1/0		2/0	2/0	2/0	2/0					15.5				
16	1/0		2/0	2/0	2/0	2/0					16.9				
17	1/0		2/0	2/0	2/0	2/0					16.1				
18	1/0		2/0	2/0	2/0	2/0					17.0				
19	1/0		2/0	2/0	2/0	2/0					15.9				
20	1/0		2/0	2/0	2/0	2/0					16.3				
21	1/0		2/0	2/0	2/0	2/0					17.7				
22	1/0		2/0	2/0	2/0	2/0					17.3				
23	1/0		2/0	2/0	2/0	2/0					18.2				
24	1/0		2/0	2/0	2/0	2/0					18.6				
25	1/0		2/0	2/0	2/0	2/0					18.4				
26	1/0		2/0	2/0	2/0	2/0					18.2				
27	1/0		2/0	2/0	2/0	2/0					18.4				
28	1/0		2/0	2/0	2/0	2/0					18.5				
29	1/0		2/0	2/0	2/0	2/0					18.3				
30	1/0		2/0	2/0	2/0	2/0					17.2				
											16.1				
											18.6				
											12.8				

Jun-13

[illegible]



Distribution System Monitoring

WSSN 2310

Jun-13

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Jun-13

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				120			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of May 2013

ENTERED

Flint Water Plant
NAME OF WATER SYSTEM

2310

Genesee
COUNTY

RESOURCE MANAGEMENT DIVISION

Michael Glasgow
CERTIFIED OPERATOR

JUN 07 2013

F-1R S-3
CLASSIFICATION

LANSING DISTRICT

SIGNATURE OF APPROPRIATE OFFICIAL

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MP



Coagulation Parameters

WSSN 2310

May-13

[illegible]



Flouridation & Chlorination

WSSN 2310

May-13

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well			Tap	
								Free	Free	Free	Free			Free	
		Raw	Tap	Dist											
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.57					0.9	1.0	0.9	0.9			0.9	
2			0.54					0.7	1.0	1.0	0.9			0.9	
3			0.56					0.9	1.0	0.9	0.9			1.0	
4			0.58					0.9	0.9	0.7	0.7			1.0	
5			0.56					0.7	0.9	0.9	0.9			0.9	
6			0.63					0.9	1.0	0.9	0.9			1.0	
7			0.54					0.7	1.0	0.8	0.8			0.8	
8			0.56					1.0	1.0	0.9	0.8			0.9	
9			0.51					0.8	1.0	0.8	0.8			0.9	
10			0.54					0.9	1.0	0.9	0.9			1.0	
11			0.52					0.9	1.0	0.9	0.9			1.0	
12			0.51					0.7	0.9	0.9	0.8			0.9	
13			0.50					0.8	1.0	0.9	0.8			0.9	
14			0.50					0.7	1.0	0.8	0.7			0.9	
15			0.50					0.9	0.9	0.8	0.7			0.9	
16			0.54					0.8	1.0	0.8	0.7			0.8	
17			0.55					0.8	1.0	0.8	0.8			0.9	
18			0.55					0.9	0.9	0.9	0.8			0.9	
19			0.52					0.8	0.9	0.8	0.7			0.9	
20			0.56					0.8	1.0	0.8	0.7			0.9	
21			0.62					0.8	0.9	0.7	0.8			0.9	
22			0.57					0.8	1.0	0.9	0.7			0.9	
23			0.58					0.9	1.0	0.9	0.7			0.8	
24			0.57					0.9	0.9	0.8	0.8			0.9	
25			0.54					0.8	0.9	0.8	0.7			1.0	
26			0.57					0.8	0.9	0.9	0.8			0.9	
27			0.55					0.7	1.0	0.9	0.9			0.8	
28			0.54					0.8	1.0	0.9	0.8			0.9	
29			0.52					0.9	1.0	0.8	0.8			0.9	
30			0.54					0.7	1.0	0.9	0.8			0.8	
31			0.59					0.9	0.9	0.9	0.8			1.0	
AVG			0.55					0.8	1.0	0.9	0.8			0.9	
MAX			0.63					1.0	1.0	1.0	0.9			1.0	
MIN			0.50					0.7	0.9	0.7	0.7			0.8	



Chemical Analyses

WSSN 2310

May-13

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.23		98		69		29				29.7		5.8		
2		7.32		98		71		27				28.9		6.3		
3		7.30		98		71		27				29.7		5.8		
4		7.21		98		73		25				27.3		7.3		
5		7.28		98		71		27				29.7		5.8		
6		7.36		96		65		31				31.3		4.4		
7		7.33		98		71		27				29.7		5.8		
8		7.50		98		73		25				29.7		5.8		
9		7.43		98		71		27				28.9		6.3		
10		7.38		98		67		31				31.3		4.9		
11		7.31		96		73		23				31.3		4.4		
12		7.34		98		71		27				28.1		6.8		
13		7.44		98		66		32				29.7		5.8		
14		7.30		98		70		28				29.7		5.8		
15		7.38		98		72		26				28.9		6.3		
16		7.37		98		72		26				29.7		5.8		
17		7.40		98		73		25				30.5		4.9		
18		7.32		98		72		26				31.3		4.9		
19		7.22		98		72		26				28.9		6.3		
20		7.37		98		69		29				29.7		5.8		
21		7.37		96		68		28				28.9		5.8		
22		7.39		98		71		27				29.7		5.8		
23		7.41		98		72		26				28.9		6.3		
24		7.38		96		68		28				31.3		4.4		
25		7.30		96		70		26				29.7		5.3		
26		7.25		96		66		30				29.7		5.3		
27		7.38		98		71		27				29.7		5.8		
28		7.29		98		74		24				29.7		5.8		
29		7.30		96		67		29				28.9		5.8		
30		7.29		98		73		25				29.7		5.8		
31		7.30		100		68		32				30.5		5.8		
AVG		7.34		98		70		27				29.7		5.7		
MAX		7.50		100		74		32				31.3		7.3		
MIN		7.21		96		65		23				27.3		4.4		

**Bacteriological & Physical Parameters****WSSN 2310****May-13**

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Pump	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					12.1				
2	1/0		2/0	2/0	2/0	2/0					11.7				
3	1/0		2/0	2/0	2/0	2/0					12.2				
4	1/0		2/0	2/0	2/0	2/0					11.0				
5	1/0		2/0	2/0	2/0	2/0					10.9				
6	1/0		2/0	2/0	2/0	2/0					11.8				
7	1/0		2/0	2/0	2/0	2/0					11.4				
8	1/0		2/0	2/0	2/0	2/0					12.5				
9	1/0		2/0	2/0	2/0	2/0			< 2		12.2				
10	1/0		2/0	2/0	2/0	2/0					13.0				
11	1/0		2/0	2/0	2/0	2/0					12.2				
12	1/0		2/0	2/0	2/0	2/0					11.5				
13	1/0		2/0	2/0	2/0	2/0					10.8				
14	1/0		2/0	2/0	2/0	2/0					11.1				
15	1/0		2/0	2/0	2/0	2/0					12.4				
16	1/0		2/0	2/0	2/0	2/0					12.2				
17	1/0		2/0	2/0	2/0	2/0					13.5				
18	1/0		2/0	2/0	2/0	2/0					12.6				
19	1/0		2/0	2/0	2/0	2/0					12.3				
20	1/0		2/0	2/0	2/0	2/0					12.5				
21	1/0		2/0	2/0	2/0	2/0					13.1				
22	1/0		2/0	2/0	2/0	2/0					14.3				
23	1/0		2/0	2/0	2/0	2/0					13.0				
24	1/0		2/0	2/0	2/0	2/0					12.5				
25	1/0		2/0	2/0	2/0	2/0					12.8				
26	1/0		2/0	2/0	2/0	2/0					11.9				
27	1/0		2/0	2/0	2/0	2/0					12.1				
28	1/0		2/0	2/0	2/0	2/0					13.3				
29	1/0		2/0	2/0	2/0	2/0					12.6				
30	1/0		2/0	2/0	2/0	2/0					14.6				
31	1/0		2/0	2/0	2/0	2/0					14.5				
											12.4				
											14.6				
											10.8				

May-13

[illegible]



Distribution System Monitoring

WSSN 2310

May-13

D A T E	Total Chlorine Residual at Bacteriological Monitoring Stations mg/l												
	1	2	3	4	5	6	7	8	CS	WR	STA II AM	STA II PM	Number of Samples
1	1.0	0.7	1.0	0.9	1.0	1.0	1.1	1.0	0.8	0.9	1.2	1.0	12
2	1.3	0.9	1.0	1.1	0.9	0.8	0.9	1.1	0.8	0.9	1.2	1.1	12
3									0.8	1.0	1.2	1.2	4
4											1.0	1.0	2
5											1.1	1.0	2
6									0.9	0.9	1.1	1.1	4
7											1.2	1.0	2
8	1.0	1.1	1.0	1.0	0.9	0.9	1.0	1.1	0.7	0.9	1.1	1.0	12
9	1.1	1.0	0.9	1.0	0.7	0.7	0.8	0.9	0.8	0.8	1.2	1.1	12
10									0.7	0.8	1.2	1.1	4
11											1.2	1.1	2
12											1.0	1.0	2
13									0.8	0.8	1.2	1.0	4
14											1.1	1.0	2
15	1.0	1.0	1.1	1.0	0.9		0.9	1.0	0.7	0.8	1.2	1.0	11
16	1.2	1.0	1.0	1.0	0.9	0.7	1.0	0.9	0.8	0.9	1.2	1.0	12
17									0.6	0.9	1.2	1.0	4
18											1.1	1.1	2
19											1.0	1.0	2
20											1.1	1.1	2
21									0.8	0.9	1.0	1.1	4
22	0.7	0.9	1.0	0.9	0.8	0.9	0.9	1.0	0.7	0.7	1.2	1.0	12
23	1.0	0.9	0.8	1.0	0.9	0.6	0.7	1.0	0.8	0.8	1.2	1.0	12
24									0.7	0.8	1.1	1.1	4
25											1.0	1.0	2
26											1.0	1.0	2
27											1.3	1.0	2
28											1.2	1.1	2
29									0.7	0.8	1.2	1.1	4
30	1.2	0.9	0.8	0.9	0.8	0.5	0.8	1.0	0.8	0.8	1.2	1.1	12
31									0.6	0.8	1.2	1.0	4

Monthly Cl₂ Avg. 0.963Quarterly Cl₂ Avg. 1.021Yearly Cl₂ Avg. 0.875

Total Samples 169



ROUTINE POSITIVE DISTRIBUTION SAMPLES

May-13

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				169			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of April 2013

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

DEQ
WATER MANAGEMENT DIVISION

F-1R S-3
CLASSIFICATION

MAY 13 2013

SIGNATURE OF APPROPRIATE OFFICIAL

LANSING DISTRICT

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al3+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MS

Apr-13

[illegible]


Flouridation & Chlorination
WSSN 2310
Apr-13

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well	Tap			
		Free	Free	Free				Free			Free				
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.72					0.9	1.0	1.0	1.0			1.0	
2			0.70					0.9	1.1	1.0	1.0			1.1	
3			0.70					1.0	1.1	1.0	1.0			1.0	
4			0.59					0.8	1.1	1.0	0.9			0.8	
5			0.63					1.0	1.0	1.0	1.0			1.1	
6			n/a					1.0	1.0	1.0	0.9			1.0	
7			0.63					0.7	1.0	1.0	1.0			0.9	
8			0.57					0.9	1.1	0.9	0.9			0.9	
9			0.57					0.9	1.1	1.0	0.9			1.0	
10			0.57					0.9	1.0	1.0	0.9			1.0	
11			0.52					0.8	1.1	1.0	1.0			1.0	
12			0.54					0.9	1.2	1.0	1.0			1.2	
13			0.53					0.7	1.0	0.9	0.9			0.9	
14			0.47					0.7	1.0	0.9	0.9			0.9	
15			0.55					0.8	0.9	0.9	0.9			0.9	
16			0.57					0.8	0.9	0.8	0.9			0.9	
17			0.54					0.7	1.0	1.0	0.9			1.1	
18			0.55					0.7	1.0	0.9	0.8			1.0	
19			0.54					0.8	1.1	0.9	1.0			1.1	
20			0.57					0.9	1.0	0.9	0.9			1.0	
21			0.46					0.7	0.9	0.9	0.8			0.9	
22			0.55					0.9	1.0	0.9	0.9			0.9	
23			0.54					0.7	0.9	0.9	0.9			0.9	
24			0.54					0.9	1.0	0.9	0.9			1.0	
25			0.52					0.8	1.0	0.8	0.8			0.9	
26			0.54					0.9	1.1	0.9	0.9			1.0	
27			0.54					1.0	1.1	1.0	0.9			1.1	
28			0.52					0.9	1.0	0.9	0.8			0.8	
29			0.51					0.8	1.0	0.8	0.8			0.9	
30			0.55					0.7	1.0	0.9	0.8			0.9	
AVG			0.56					0.8	1.0	0.9	0.9			1.0	
MAX			0.72					1.0	1.2	1.0	1.0			1.2	
MIN			0.46					0.7	0.9	0.8	0.8			0.8	



Chemical Analyses

WSSN 2310

Apr-13

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.31		98		72		26				27.3		7.3		
2		7.32		96		73		23				32.1		3.9		
3		7.43		100		71		29				31.3		5.3		
4		7.37		96		71		25				29.7		5.3		
5		7.31		98		70		28				29.7		5.8		
6		7.40		100		76		24				28.1		7.3		
7		7.32		98		73		25				29.7		5.8		
8		7.45		98		72		26				30.5		5.3		
9		7.30		100		70		30				31.3		5.3		
10		7.36		100		72		28				30.5		5.8		
11		7.25		100		72		28				30.5		5.3		
12		7.29		100		72		28				31.3		5.3		
13		7.28		98		73		25				29.7		5.8		
14		7.24		98		74		24				29.7		5.8		
15		7.26		98		72		26				30.5		5.3		
16		7.28		98		73		25				29.7		5.8		
17		7.26		98		72		26				29.7		5.8		
18		7.30		98		70		28				29.7		5.8		
19		7.30		100		73		27				33.7		3.9		
20		7.29		98		69		29				31.3		4.9		
21		7.33		94		74		20				30.5		4.4		
22		7.28		98		66		32				30.5		5.3		
23		7.28		98		70		28				31.3		4.9		
24		7.41		96		72		24				30.5		4.9		
25		7.47		98		74		24				30.5		5.3		
26		7.27		98		72		26				30.5		5.3		
27		7.31		98		72		26				30.5		5.3		
28		7.26		98		75		23				29.7		5.8		
29		7.33		98		68		30				29.7		5.8		
30		7.26		98		64		34				30.5		5.3		
AVG		7.32		98		72		27				30.3		5.4		
MAX		7.47		100		76		34				33.7		7.3		
MIN		7.24		94		64		20				27.3		3.9		

**Bacteriological & Physical Parameters****WSSN 2310****Apr-13**

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Pump	Lab Tap									
	60	61	62	63	64	65									
1	1/0		2/0	2/0	2/0	2/0					11.8				
2	1/0		2/0	2/0	2/0	2/0					11.2				
3	1/0		2/0	2/0	2/0	2/0					10.5				
4	1/0		2/0	2/0	2/0	2/0					11.4				
5	1/0		2/0	2/0	2/0	2/0					11.5				
6	1/0		2/0	2/0	2/0	2/0					9.3				
7	1/0		2/0	2/0	2/0	2/0					10.3				
8	1/0		2/0	2/0	2/0	2/0					9.9				
9	1/0		2/0	2/0	2/0	2/0					11.2				
10	1/0		2/0	2/0	2/0	2/0					10.2				
11	1/0		2/0	2/0	2/0	2/0					11.5				
12	1/0		2/0	2/0	2/0	2/0					11.5				
13	1/0		2/0	2/0	2/0	2/0					11.2				
14	1/0		2/0	2/0	2/0	2/0					11.6				
15	1/0		2/0	2/0	2/0	2/0					11.4				
16	1/0		2/0	2/0	2/0	2/0					10.2				
17	1/0		2/0	2/0	2/0	2/0					9.8				
18	1/0		2/0	2/0	2/0	2/0					10.4				
19	1/0		2/0	2/0	2/0	2/0					11.2				
20	1/0		2/0	2/0	2/0	2/0					10.5				
21	1/0		2/0	2/0	2/0	2/0					9.8				
22	1/0		2/0	2/0	2/0	2/0					10.3				
23	1/0		2/0	2/0	2/0	2/0					10.6				
24	1/0		2/0	2/0	2/0	2/0			< 2		11.3				
25	1/0		2/0	2/0	2/0	2/0					10.5				
26	1/0		2/0	2/0	2/0	2/0					12.1				
27	1/0		2/0	2/0	2/0	2/0					9.4				
28	1/0		2/0	2/0	2/0	2/0					10.3				
29	1/0		2/0	2/0	2/0	2/0					10.2				
30	1/0		2/0	2/0	2/0	2/0					10.3				
											10.7				
											12.1				
											9.3				



Distribution System Monitoring

WSSN 2310

Apr-13

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Apr-13

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				148			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of March 2013

ENTERED

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION

Michael Glasgow
SIGNATURE OF APPROPRIATE OFFICIAL

DEQ
RESOURCE MANAGEMENT DIVISION

APR 17 2013

LANSING DISTRICT

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al3+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MP



Coagulation Parameters

WSSN 2310

Mar-13

[illegible]

**Flouridation & Chlorination****WSSN 2310****Mar-13**

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
		Raw	Tap	Dist	Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P Free	Sta II Free	Dort Free	3MG Well Free			Tap Free		
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.59					0.9	1.0	1.0	1.0			1.1	
2			0.58					1.0	1.1	1.1	1.0			1.1	
3			0.57					0.7	0.9	0.8	0.9			0.8	
4			0.58					0.9	1.0	0.9	0.8			1.0	
5			0.54					0.8	1.0	0.9	0.8			0.9	
6			0.56					0.9	1.0	0.9	0.9			1.0	
7			0.56					0.9	1.0	0.9	0.8			0.9	
8			0.62					0.9	1.1	1.0	0.9			1.1	
9			0.65					0.9	1.0	1.0	1.0			1.0	
10			0.68					0.7	1.0	1.0	0.9			0.9	
11			0.66					0.8	0.9	0.9	0.8			0.8	
12			0.65					0.7	1.0	0.9	0.8			0.9	
13			0.65					0.9	1.0	0.9	0.9			1.0	
14			0.60					0.7	1.0	0.9	0.9			0.9	
15			0.64					0.8	1.0	0.9	0.9			0.9	
16			0.64					0.7	0.9	0.9	0.8			0.8	
17			0.56					0.7	1.0	0.9	0.8			0.9	
18			0.64					0.9	1.1	1.0	0.9			1.1	
19			0.67					0.9	1.0	0.9	0.9			1.0	
20			0.70					0.9	1.0	0.9	0.9			1.0	
21			0.63					0.7	1.1	0.9	0.9			0.9	
22			0.65					0.9	1.1	1.0	0.9			1.1	
23			0.68					1.0	1.1	1.0	1.0			1.1	
24			0.65					0.5	1.0	1.0	0.9			0.9	
25			0.68					0.9	1.0	1.0	0.9			0.9	
26			0.70					0.7	1.1	1.0	0.9			1.0	
27			0.70					0.9	1.1	1.0	1.0			1.0	
28			0.65					1.0	1.1	1.0	0.9			1.0	
29			0.68					1.0	1.2	1.1	1.0			1.1	
30			0.67					0.9	1.1	1.0	1.0			1.1	
31			0.67					0.9	1.1	1.0	1.0			1.0	
AVG			0.64					0.8	1.0	1.0	0.9			1.0	
MAX			0.70					1.0	1.2	1.1	1.0			1.1	
MIN			0.54					0.5	0.9	0.8	0.8			0.8	

**Chemical Analyses****WSSN 2310****Mar-13**

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.24		96		64		32				32.1		3.9		
2		7.21		98		72		26				29.7		5.8		
3		7.20		100		72		28				32.1		4.9		
4		7.24		98		67		31				30.5		5.3		
5		7.25		100		71		29				31.3		5.3		
6		7.29		98		71		27				30.5		5.3		
7		7.22		98		73		25				32.1		4.4		
8		7.27		102		75		27				32.1		5.3		
9		7.31		102		69		33				37.7		4.4		
10		7.25		98		70		28				31.3		5.3		
11		7.31		100		72		28				33.7		3.9		
12		7.31		100		70		30				31.3		5.3		
13		7.41		98		71		27				31.3		4.9		
14		7.27		98		69		29				31.3		4.9		
15		7.18		104		72		32				32.9		5.3		
16		7.27		100		74		26				32.9		4.4		
17		7.33		98		70		28				32.9		3.9		
18		7.23		96		71		25				30.5		4.9		
19		7.22		98		70		28				29.7		5.8		
20		7.34		100		66		34				31.3		5.3		
21		7.30		98		72		26				29.7		5.8		
22		7.17		100		71		29				30.5		5.8		
23		7.23		98		71		27				32.1		4.4		
24		7.26		98		67		31				30.5		5.3		
25		7.38		98		70		28				29.7		5.8		
26		7.34		98		68		30				29.7		5.8		
27		7.30		98		69		29				29.7		5.8		
28		7.30		98		72		26				29.7		5.8		
29		7.20		94		66		28				30.5		6.8		
30		7.23		96		71		25				32.1		3.9		
31		7.20		96		70		26				27.3		6.8		
AVG		7.27		99		70		28				31.2		5.2		
MAX		7.41		104		75		34				37.7		6.8		
MIN		7.17		94		64		25				27.3		3.9		

**Bacteriological & Physical Parameters****WSSN 2310****Mar-13**

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg. C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Pump	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					9.2				
2	1/0		2/0	2/0	2/0	2/0					9.5				
3	1/0		2/0	2/0	2/0	2/0					10.1				
4	1/0		2/0	2/0	2/0	2/0					10.3				
5	1/0		2/0	2/0	2/0	2/0					10.0				
6	1/0		2/0	2/0	2/0	2/0			< 2		10.6				
7	1/0		2/0	2/0	2/0	2/0					10.5				
8	1/0		2/0	2/0	2/0	2/0					10.7				
9	1/0		2/0	2/0	2/0	2/0					10.1				
10	1/0		2/0	2/0	2/0	2/0					10.9				
11	1/0		2/0	2/0	2/0	2/0					10.7				
12	1/0		2/0	2/0	2/0	2/0					10.7				
13	1/0		2/0	2/0	2/0	2/0					10.7				
14	1/0		2/0	2/0	2/0	2/0					10.3				
15	1/0		2/0	2/0	2/0	2/0					10.3				
16	1/0		2/0	2/0	2/0	2/0					10.7				
17	1/0		2/0	2/0	2/0	2/0					10.3				
18	1/0		2/0	2/0	2/0	2/0					11.1				
19	1/0		2/0	2/0	2/0	2/0					10.8				
20	1/0		2/0	2/0	2/0	2/0					10.5				
21	1/0		2/0	2/0	2/0	2/0					9.9				
22	1/0		2/0	2/0	2/0	2/0					10.7				
23	1/0		2/0	2/0	2/0	2/0					11.0				
24	1/0		2/0	2/0	2/0	2/0					9.6				
25	1/0		2/0	2/0	2/0	2/0					11.2				
26	1/0		2/0	2/0	2/0	2/0					10.6				
27	1/0		2/0	2/0	2/0	2/0					10.7				
28	1/0		2/0	2/0	2/0	2/0					10.7				
29	1/0		2/0	2/0	2/0	2/0					12.3				
30	1/0		2/0	2/0	2/0	2/0					11.0				
31	1/0		2/0	2/0	2/0	2/0					10.6				
											10.5				
											12.3				
											9.2				



Distribution System Monitoring

WSSN 2310

Mar-13

[illegible]



Distribution System Monitoring

WSSN 2310

Mar-13

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Mar-13

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				153			
Total number of routine distribution samples required				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

ENTERED

For Month of February 2013

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION

Michael Glasgow
SIGNATURE OF APPROPRIATE OFFICIAL

DEQ
RESOURCE MANAGEMENT DIVISION

MAR 13 2013

LANSING DISTRICT

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al3+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MF

Feb-13

[illegible]

**Flouridation & Chlorination****WSSN 2310****Feb-13**

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well	Tap			
		Free	Free	Free				Free			Free				
		14	15	16	17	18	19	20	21	22	23	24	25	26	27
1			0.62					0.8	1.0	0.9	0.9			1.0	
2			0.57					0.8	0.9	0.7	0.8			0.8	
3			0.63					0.7	0.9	0.8	0.8			0.8	
4			0.60					0.8	0.9	0.9	0.8			0.8	
5			0.60					0.8	0.9	0.9	0.8			0.9	
6			0.59					0.8	0.8	0.8	0.8			0.9	
7			0.60					0.7	1.0	0.9	0.8			0.8	
8			0.61					0.8	1.0	0.9	0.8			1.1	
9			0.64					1.0	1.1	1.0	1.0			n.r.	
10			0.54					0.5	0.9	0.8	0.7			0.9	
11			0.54					0.8	1.0	0.9	0.8			0.9	
12			0.52					0.8	1.0	0.9	0.8			0.9	
13			0.54					0.7	1.0	0.9	0.9			0.9	
14			0.52					0.8	0.9	0.9	0.9			1.0	
15			0.56					0.8	1.0	0.9	0.9			1.0	
16			0.53					1.0	1.1	1.0	0.9			1.0	
17			0.54					0.9	1.0	0.9	0.9			1.0	
18			0.59					0.9	1.0	0.9	0.9			1.0	
19			0.61					0.9	1.0	0.9	0.9			1.0	
20			0.59					0.9	1.0	0.8	0.8			0.9	
21			0.58					0.8	1.0	0.8	0.7			0.9	
22			0.60					0.9	1.0	0.9	0.9			1.0	
23			0.61					0.9	1.1	1.0	1.0			1.1	
24			0.59					0.7	0.9	0.8	0.9			0.9	
25			0.60					0.9	1.1	0.9	0.9			0.9	
26			0.56					0.7	1.0	0.9	0.8			0.8	
27			0.59					0.9	1.0	1.0	0.9			1.0	
28			0.50					0.9	1.0	0.9	0.9			0.9	
AVG			0.58					0.8	1.0	0.9	0.9			0.9	
MAX			0.64					1.0	1.1	1.0	1.0			1.1	
MIN			0.50					0.5	0.8	0.7	0.7			0.8	

n.r. = Not recorded or not tested



Chemical Analyses

WSSN 2310

Feb-13

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.26		100		63		37				36.9		1.9		
2		7.45		100		71		29				36.9		1.9		
3		7.21		98		64		34				34.5		2.9		
4		7.23		98		69		29				33.7		3.4		
5		7.26		98		66		32				34.5		2.9		
6		7.39		98		67		31				32.9		3.9		
7		7.30		98		68		30				33.7		3.4		
8		7.27		100		72		28				31.3		5.3		
9		7.29		98		72		26				29.7		5.3		
10		7.35		100		66		34				32.1		4.9		
11		7.59		98		66		32				31.3		4.9		
12		7.21		98		68		30				35.3		2.4		
13		7.36		98		72		26				32.9		3.9		
14		7.23		96		70		26				31.3		4.4		
15		7.26		100		66		34				30.5		5.8		
16		7.24		96		72		24				30.5		4.9		
17		7.30		100		69		31				29.7		6.3		
18		7.30		96		68		28				28.9		5.8		
19		7.23		100		72		28				30.5		5.8		
20		7.24		100		72		28				31.3		5.1		
21		7.20		98		70		28				32.1		4.4		
22		7.22		98		71		27				30.5		5.3		
23		7.22		96		68		28				31.3		4.4		
24		7.16		98		69		29				33.7		3.4		
25		7.23		98		71		27				31.3		4.9		
26		7.26		98		69		29				31.3		4.9		
27		7.40		98		69		29				31.3		4.9		
28		7.20		100		70		30				32.1		4.9		
AVG		7.28		98		69		29				32.2		4.4		
MAX		7.59		100		72		37				36.9		6.3		
MIN		7.16		96		63		24				28.9		1.9		

**Bacteriological & Physical Parameters****WSSN 2310****Feb-13**

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap		
	B&P		Dort	3MG Well	Pump	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		1/0	2/0	2/0	2/0					9.5				
2	1/0		2/0	2/0	2/0	2/0					9.8				
3	1/0		2/0	2/0	2/0	2/0					9.9				
4	1/0		2/0	2/0	2/0	2/0					9.3				
5	1/0		2/0	2/0	2/0	2/0					n.r.				
6	1/0		2/0	2/0	2/0	2/0					9.5				
7	1/0		2/0	2/0	2/0	2/0					8.7				
8	1/0		2/0	2/0	2/0	2/0					9.5				
9	1/0		2/0	2/0	2/0	2/0					7.7				
10	1/0		2/0	2/0	2/0	2/0					8.9				
11	1/0		2/0	2/0	2/0	2/0					9.7				
12	1/0		2/0	2/0	2/0	2/0					8.8				
13	1/0		2/0	2/0	2/0	2/0			< 2		9.1				
14	1/0		2/0	2/0	2/0	2/0					12.2				
15	1/0		2/0	2/0	2/0	2/0					12.5				
16	1/0		2/0	2/0	2/0	2/0					8.9				
17	1/0		2/0	2/0	2/0	2/0					10.4				
18	1/0		2/0	2/0	2/0	2/0					9.6				
19	1/0		2/0	2/0	2/0	2/0					10.6				
20	1/0		2/0	2/0	2/0	2/0					9.3				
21	1/0		2/0	2/0	2/0	2/0					9.5				
22	1/0		2/0	2/0	2/0	2/0					10.3				
23	1/0		2/0	2/0	2/0	2/0					9.7				
24	1/0		2/0	2/0	2/0	2/0					9.2				
25	1/0		2/0	2/0	2/0	2/0					9.0				
26	1/0		2/0	2/0	2/0	2/0					10.0				
27	1/0		2/0	2/0	2/0	2/0					9.7				
28	1/0		2/0	2/0	2/0	2/0					10.3				
											9.7				
											12.5				
											7.7				

n.r. = Not recorded or not tested

Feb-13

[illegible]



Distribution System Monitoring

WSSN 2310

Feb-13

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Feb-13

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				146			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of January 2013

Flint Water Plant
NAME OF WATER SYSTEM

2310

Genesee
COUNTY

DEQ
RESOURCE MANAGEMENT DIVISION

Michael Glasgow
CERTIFIED OPERATOR

FEB 13 2013

F-1R S-3
CLASSIFICATION

SIGNATURE OF APPROPRIATE OFFICIAL

LANSING DISTRICT

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

A turbidity spike (inline alarm) was encountered on 1/20/2013 at 5:20pm at Baxter & Potter Rd. A coliform bacteria and turbidity sample were collected at 11:30pm. The sample showed a 0.9 NTU turbidity, a free chlorine residual of 0.8 mg/L, and was absent of coliform bacteria. On 1/21/2013, the daily B&P sample collected at 12:00pm, showed turbidity of .147 NTU. The turbidity event lasted between 12 to 18 hours. The turbidity spike reached Control Station #2 at 3:00pm on the 1/21/2013, and was diverted to Dort Well to allow for some dilution and possible settling for a few days. Daily samples collected from CS# 2 and Dort Well on the 21st and throughout the remainder of the month displayed good chlorine residuals and were absent of coliform bacteria. Lab testing later in the month showed higher levels of calcium, which leads us to believe the spike may have been from a slug of scale in the pipeline.

Submit to:

Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909



Coagulation Parameters

WSSN 2310

Jan-13

[illegible]



Flouridation & Chlorination

WSSN 2310

Jan-13

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
		Raw	Tap	Dist		Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well			Tap	
								Free	Free	Free	Free			Free	
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.64					0.6	0.8	0.7	0.7			0.9	
2			0.66					0.8	0.9	0.9	0.8			0.8	
3			0.68					0.6	0.9	0.8	0.8			0.8	
4			0.67					0.8	0.9	0.9	0.9			0.9	
5			0.61					0.5	0.8	0.7	0.8			0.8	
6			0.62					0.8	0.9	0.8	0.7			0.8	
7			0.68					0.8	1.0	0.8	0.7			0.9	
8			0.69					0.6	1.0	0.8	0.7			0.8	
9			0.60					0.8	0.9	0.8	0.8			0.7	
10			0.67					0.6	0.9	0.8	0.8			0.9	
11			0.71					0.8	1.0	0.8	0.8			0.9	
12			0.65					0.7	0.8	0.7	0.7			0.9	
13			0.66					0.6	0.9	0.8	0.7			0.8	
14			0.70					0.7	0.9	0.8	0.8			0.8	
15			0.71					0.7	0.9	0.9	0.7			0.8	
16			0.69					0.8	0.9	0.9	0.8			0.9	
17			0.60					0.7	0.8	0.8	0.7			0.8	
18			0.69					0.8	0.9	0.8	0.8			0.7	
19			0.66					0.7	0.9	0.8	0.8			0.8	
20			0.64					0.7	0.9	0.8	0.7			0.8	
21			0.68					0.7	0.9	0.8	0.8			0.8	
22			0.65					0.7	0.9	0.8	0.8			0.8	
23			0.65					0.8	0.9	0.8	0.8			0.9	
24			0.63					0.8	1.0	0.9	0.8			0.9	
25			0.63					1.1	1.0	0.9	0.8			1.0	
26			0.65					0.8	1.0	0.8	0.9			0.9	
27			0.63					0.6	1.0	0.8	0.8			0.9	
28			0.60					0.8	0.7	0.9	0.8			0.8	
29			0.57					0.7	1.0	0.8	0.8			0.9	
30			0.62					0.8	1.0	0.9	0.8			0.9	
31			0.55					0.7	0.9	0.9	0.8			0.9	
AVG			0.65					0.7	0.9	0.8	0.8			0.8	
MAX			0.71					1.1	1.0	0.9	0.9			1.0	
MIN			0.55					0.5	0.7	0.7	0.7			0.7	

**Chemical Analyses****WSSN 2310****Jan-13**

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.18		98		70		28				29.7		5.8		
2		7.22		98		70		28				29.7		5.8		
3		7.32		100		71		29				29.7		6.3		
4		7.25		100		68		32				29.7		6.3		
5		7.19		100		66		34				28.9		6.8		
6		7.21		100		66		34				28.9		6.8		
7		7.25		100		69		31				29.7		6.3		
8		7.21		100		70		30				29.7		6.3		
9		7.27		100		70		30				29.7		6.3		
10		7.27		98		71		27				29.7		5.8		
11		7.28		98		68		30				29.7		5.8		
12		7.21		100		68		32				29.7		6.3		
13		7.22		98		69		29				28.9		6.3		
14		7.50		98		69		29				28.9		6.3		
15		7.36		98		69		29				28.9		6.3		
16		7.34		98		71		27				29.7		5.8		
17		7.39		100		67		33				29.7		5.8		
18		7.34		100		74		26				29.7		6.3		
19		7.29		100		72		28				28.9		6.8		
20		7.25		98		67		31				29.7		5.8		
21		7.25		98		68		30				29.7		5.8		
22		7.33		98		73		25				28.1		6.8		
23		7.33		96		70		26				28.9		5.8		
24		7.32		96		69		27				28.9		5.8		
25		7.32		98		64		34				28.9		6.3		
26		7.29		92		66		26				26.5		6.3		
27		7.16		98		69		29				29.7		5.8		
28		7.26		98		68		30				29.7		5.8		
29		7.28		100		70		30				36.1		2.4		
30		7.31		98		71		27				34.5		2.9		
31		7.29		98		70		28				36.1		1.9		
AVG		7.28		98		69		29				29.9		5.8		
MAX		7.50		100		74		34				36.1		6.8		
MIN		7.16		92		64		25				26.5		1.9		



Bacteriological & Physical Parameters

WSSN 2310

Jan-13

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Pump	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0				13.3					
2	1/0		2/0	2/0	2/0	2/0				13.3					
3	1/0		2/0	2/0	2/0	2/0				12.2					
4	1/0		2/0	2/0	2/0	2/0				13.9					
5	1/0		2/0	2/0	2/0	2/0				12.0					
6	1/0		2/0	2/0	2/0	2/0				12.0					
7	1/0		2/0	2/0	2/0	2/0				11.3					
8	1/0		2/0	2/0	2/0	2/0				10.9					
9	1/0		2/0	2/0	2/0	2/0				12.5					
10	1/0		2/0	2/0	2/0	2/0				11.7					
11	1/0		2/0	2/0	2/0	2/0				12.7					
12	1/0		2/0	2/0	2/0	2/0				12.5					
13	1/0		2/0	2/0	2/0	2/0				12.7					
14	1/0		2/0	2/0	2/0	2/0				12.2					
15	1/0		2/0	2/0	2/0	2/0				10.2					
16	1/0		2/0	2/0	2/0	2/0				10.8					
17	1/0		2/0	2/0	2/0	2/0				9.5					
18	1/0		2/0	2/0	2/0	2/0				9.1					
19	1/0		2/0	2/0	2/0	2/0				10.5					
20	2/0		2/0	2/0	2/0	2/0				10.1					
21	1/0		2/0	2/0	2/0	2/0				9.2					
22	1/0		2/0	2/0	2/0	2/0				9.3					
23	1/0		2/0	2/0	2/0	2/0				10.8					
24	1/0		2/0	2/0	2/0	2/0				12.2					
25	1/0		2/0	2/0	2/0	2/0				11.7					
26	1/0		2/0	2/0	2/0	2/0				9.6					
27	1/0		2/0	2/0	2/0	2/0				10.4					
28	1/0		2/0	2/0	2/0	2/0				10.7					
29	1/0		2/0	2/0	2/0	2/0				9.9					
30	1/0		2/0	2/0	2/0	2/0				9.9					
31	1/0		2/0	2/0	2/0	2/0		< 2		9.2					
											11.2				
											13.9				
											9.1				

Jan-13

[illegible]

Jan-13

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				149			
Total number of routine distribution samples required:				100			

**MONTHLY OPERATION REPORT
OF
WATER TREATMENT PLANT****For Month of December 2012**Flint Water Plant
NAME OF WATER SYSTEM2310
WSSNGenesee
COUNTYMichael Glasgow
CERTIFIED OPERATORDEQ
RESOURCE MANAGEMENT DIVISIONF-1R S-3
CLASSIFICATION

JAN 14 2013

SIGNATURE OF APPROPRIATE OFFICIAL

LANSING DISTRICT

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MP

Dec-12

[illegible]



Flouridation & Chlorination

WSSN 2310

Dec-12

D A T E	Fluorid e Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl	Post Chlorine (lbs/day)	B&P	Sta II	Dort	3MG Well		Tap		
		Free	Free	Free									Free		
		14	15	16	17	18	19	20	21	22	23	24	25	26	27
1			0.71				0.8	0.9	n/a	0.8			0.9		
2			0.65				0.8	0.9	n/a	0.9			0.8		
3			0.74				0.8	0.9	0.8	0.8			0.7		
4			0.75				0.8	0.9	0.8	1.0			0.7		
5			0.77				0.9	0.9	0.9	0.9			0.8		
6			0.69				0.7	0.9	0.8	0.8			0.8		
7			0.74				0.7	0.9	0.8	0.8			0.9		
8			0.74				0.7	0.8	0.8	0.8			0.8		
9			0.69				0.8	0.9	0.8	0.8			0.9		
10			0.68				0.8	0.9	0.7	0.7			0.7		
11			0.72				0.6	1.0	0.8	0.7			0.8		
12			0.70				0.8	0.9	0.8	0.7			0.7		
13			0.68				0.7	0.9	0.7	0.8			0.8		
14			0.68				0.8	0.9	0.9	0.7			0.8		
15			0.71				0.8	1.0	0.9	0.9			0.9		
16			0.76				0.6	0.9	0.7	0.6			0.7		
17			0.76				0.8	0.9	0.9	0.8			0.8		
18			0.72				0.7	0.9	0.8	0.8			0.7		
19			0.72				0.7	0.8	0.8	0.8			0.8		
20			0.72				0.6	0.9	0.7	0.7			0.7		
21			0.73				0.8	0.8	0.8	0.7			0.8		
22			0.72				0.9	0.9	0.8	0.8			0.9		
23			0.75				0.6	0.9	0.7	0.7			0.8		
24			0.71				0.6	0.8	0.7	0.7			0.7		
25			0.73				0.7	0.8	0.8	0.7			0.8		
26			0.77				0.8	0.7	0.8	0.8			0.7		
27			0.70				0.5	0.8	0.8	0.7			0.7		
28			0.70				0.8	0.8	0.8	0.7			0.8		
29			0.66				0.8	0.8	0.7	0.7			0.9		
30			0.71				0.7	0.8	0.7	0.7			0.7		
31			0.67				0.7	0.8	0.7	0.7			0.8		
AVG			0.72				0.7	0.9	0.8	0.8			0.8		
MAX			0.77				0.9	1.0	0.9	1.0			0.9		
MIN			0.65				0.5	0.7	0.7	0.6			0.7		



Chemical Analyses

WSSN 2310

Dec-12

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.29		98		71		27				30.5		5.3		
2		7.24		98		66		32				28.9		6.3		
3		7.36		98		68		30				29.7		5.8		
4		7.54		98		72		26				28.9		6.3		
5		7.37		96		70		26				29.7		5.3		
6		7.34		96		69		27				30.5		4.9		
7		7.26		98		68		30				29.7		5.8		
8		7.33		96		68		28				30.5		4.9		
9		7.32		96		69		27				28.9		5.8		
10		7.28		98		70		28				28.9		6.3		
11		7.22		100		67		33				30.5		5.8		
12		7.35		96		68		28				29.7		5.3		
13		7.38		98		71		27				29.7		5.8		
14		7.39		98		70		28				29.7		5.8		
15		7.28		96		71		25				28.9		5.8		
16		7.23		98		70		28				28.9		6.3		
17		7.39		100		72		28				28.9		6.8		
18		7.35		98		73		25				29.7		5.8		
19		7.32		98		72		26				30.5		5.3		
20		7.38		100		70		30				28.9		6.8		
21		7.31		98		64		34				28.9		6.3		
22		7.25		96		71		25				29.7		5.3		
23		7.22		100		69		31				29.7		6.3		
24		7.24		100		73		27				28.9		6.3		
25		7.28		96		71		25				28.1		6.3		
26		7.29		100		73		27				28.9		6.8		
27		7.32		98		69		29				30.5		5.3		
28		7.32		94		69		25				28.1		5.8		
29		7.26		98		69		29				28.1		6.8		
30		7.29		100		74		26				29.7		6.3		
31		7.20		98		60		38				29.7		5.8		
AVG		7.31		98		70		28				29.4		5.9		
MAX		7.54		100		74		38				30.5		6.8		
MIN		7.20		94		60		25				28.1		4.9		



Bacteriological & Physical Parameters

WSSN 2310

Dec-12

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Sta II	Lab Tap									
1	1/0		0/0	2/0	2/0	2/0					16.5				
2	1/0		0/0	2/0	2/0	2/0					16.8				
3	1/0		2/0	2/0	2/0	2/0					15.9				
4	1/0		2/0	2/0	2/0	2/0					15.9				
5	1/0		2/0	2/0	2/0	2/0					16.7				
6	1/0		2/0	2/0	2/0	2/0					15.0				
7	1/0		2/0	2/0	2/0	2/0					16.0				
8	1/0		2/0	2/0	2/0	2/0					16.6				
9	1/0		1/0	1/0	1/0	1/0					17.1				
10	1/0		2/0	2/0	2/0	2/0					16.5				
11	1/0		2/0	2/0	2/0	2/0					15.4				
12	1/0		2/0	2/0	2/0	2/0			<2		15.0				
13	1/0		2/0	2/0	2/0	2/0					16.5				
14	1/0		2/0	2/0	2/0	2/0					15.9				
15	1/0		2/0	2/0	2/0	2/0					14.9				
16	1/0		2/0	2/0	2/0	2/0					16.2				
17	1/0		2/0	2/0	2/0	2/0					15.1				
18	1/0		2/0	2/0	2/0	2/0					15.2				
19	1/0		2/0	2/0	2/0	2/0					15.8				
20	1/0		2/0	2/0	2/0	2/0					14.8				
21	1/0		2/0	2/0	2/0	2/0					15.6				
22	1/0		2/0	2/0	2/0	2/0					15.2				
23	1/0		2/0	2/0	2/0	2/0					16.0				
24	1/0		2/0	2/0	2/0	2/0					14.2				
25	1/0		2/0	2/0	2/0	2/0					13.8				
26	1/0		2/0	2/0	2/0	2/0					13.9				
27	1/0		2/0	2/0	2/0	2/0					14.6				
28	1/0		2/0	2/0	2/0	2/0					14.2				
29	1/0		2/0	2/0	2/0	2/0					13.7				
30	1/0		2/0	2/0	2/0	2/0					14.2				
31	1/0		2/0	2/0	2/0	2/0					13.1				
											15.4				
											17.1				
											13.1				



Distribution System Monitoring

WSSN 2310

Dec-12

[illegible]



Distribution System Monitoring

WSSN 2310

Dec-12

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Dec-12

Total number of positive routine samples: <u>0</u>				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				149			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of November 2012

 ENTERED

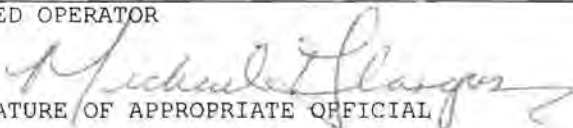
Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION


SIGNATURE OF APPROPRIATE OFFICIAL

DEQ
RESOURCE MANAGEMENT DIVISION

DEC 12 2012

LANSING DISTRICT

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al3+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MD

Nov-12

[illegible]



Flouridation & Chlorination

WSSN 2310

Nov-12

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl	Post Chlorine (lbs/day)	B&P	Sta II	Dort	3MG Well		Tap		
		Free	Free	Free				Free			Free				
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.72					0.9	0.8	0.7	0.7			0.7	
2			0.69					0.8	0.8	0.8	0.8			0.9	
3			0.70					0.7	0.8	0.7	0.7			0.7	
4			0.66					0.7	0.8	0.7	0.7			0.8	
5			0.74					0.7	0.8	0.7	0.7			0.8	
6			0.76					0.7	0.8	0.7	0.8			0.7	
7			0.70					0.7	0.8	0.6	0.8			0.7	
8			0.73					0.7	0.7	0.8	0.8			0.8	
9			0.71					0.8	0.8	0.8	0.8			0.8	
10			0.74					0.6	0.9	0.7	0.7			0.7	
11			0.70					0.7	0.8	0.7	0.8			0.7	
12			0.69					0.8	0.8	0.7	0.8			0.7	
13			0.70					0.7	0.7	0.8	0.8			0.8	
14			0.70					0.8	0.8	0.7	0.7			0.8	
15			0.65					0.8	0.8	0.7	0.7			0.9	
16			0.71					0.7	0.9	0.8	0.8			0.8	
17			0.63					0.7	0.9	0.7	0.7			0.7	
18			0.63					0.6	0.8	0.7	0.8			0.7	
19			0.68					0.8	0.7	0.8	0.8			0.7	
20			0.71					0.8	0.7	0.8	0.8			0.7	
21			0.66					0.8	0.8	0.8	0.8			0.8	
22			0.63					0.6	0.8	0.8	0.7			0.7	
23			0.69					0.7	0.8	0.7	0.7			0.7	
24			0.60					0.8	0.8	0.6	0.7			0.8	
25			0.75					0.7	0.9	0.7	0.7			0.7	
26			0.68					0.8	0.9	0.7	0.8			0.9	
27			0.72					0.7	0.9	0.8	0.8			0.7	
28			0.76					0.9	0.9	0.7	0.8			0.9	
29			0.69					0.7	0.9	0.7	0.8			0.7	
30			0.75					0.9	0.9	n/a	0.8			0.9	
AVG			0.70					0.7	0.8	0.7	0.8			0.8	
MAX			0.76					0.9	0.9	0.8	0.8			0.9	
MIN			0.60					0.6	0.7	0.6	0.7			0.7	



Chemical Analyses

WSSN 2310

Nov-12

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.28		100		72		28				29.7		6.3		
2		7.31		96		72		24				29.7		5.3		
3		7.26		98		72		26				28.9		6.3		
4		7.19		100		67		33				29.7		6.3		
5		7.18		100		66		34				30.5		5.8		
6		7.26		100		69		31				30.5		5.8		
7		7.25		98		67		31				29.7		5.8		
8		7.32		98		67		31				29.7		5.8		
9		7.26		96		68		28				28.9		5.8		
10		7.22		98		70		28				30.5		5.3		
11		7.21		98		68		30				30.5		5.3		
12		7.33		96		67		29				29.7		5.3		
13		7.21		100		68		32				28.9		6.8		
14		7.22		96		69		27				29.7		5.3		
15		7.35		n/a		n/a		n/a				n/a		n/a		
16		7.34		100		72		28				28.9		6.8		
17		7.30		98		66		32				29.7		5.3		
18		7.23		98		67		31				28.9		5.8		
19		7.35		100		73		27				30.5		5.8		
20		7.33		98		73		25				29.7		5.8		
21		7.30		98		71		27				28.9		6.3		
22		7.25		98		70		28				28.9		6.3		
23		7.27		98		72		26				28.9		6.3		
24		7.23		98		73		25				28.9		6.3		
25		7.26		98		67		31				28.9		6.3		
26		7.32		100		64		36				31.3		5.3		
27		7.33		98		71		27				28.9		6.3		
28		7.30		100		71		29				31.3		5.3		
29		7.39		98		67		31				28.9		6.3		
30		7.27		96		69		27				29.7		5.3		
AVG		7.28		98		69		29				29.6		5.9		
MAX		7.39		100		73		36				31.3		6.8		
MIN		7.18		96		64		24				28.9		5.3		



Bacteriological & Physical Parameters

WSSN 2310

Nov-12

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg. C	Color		Odor	
	Plant Tap						Raw					Tap	Raw	Tap	Raw
	B&P		Dort	3MG Well	Sta II	Lab Tap									
	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
1	1/0		2/0	2/0	2/0	2/0					18.0				
2	1/0		2/0	2/0	2/0	2/0					17.8				
3	1/0		2/0	2/0	2/0	2/0					17.8				
4	1/0		2/0	2/0	2/0	2/0					17.6				
5	1/0		2/0	2/0	2/0	2/0					17.6				
6	1/0		2/0	2/0	2/0	2/0					16.9				
7	1/0		2/0	2/0	2/0	2/0					16.5				
8	1/0		2/0	2/0	2/0	2/0					17.7				
9	1/0		2/0	2/0	2/0	2/0					16.6				
10	1/0		2/0	2/0	2/0	2/0					16.1				
11	1/0		2/0	2/0	2/0	2/0					14.7				
12	1/0		2/0	2/0	2/0	2/0					14.7				
13	1/0		2/0	2/0	2/0	2/0					14.0				
14	1/0		2/0	2/0	2/0	2/0			< 2		13.1				
15	1/0		2/0	2/0	2/0	2/0					12.7				
16	1/0		2/0	2/0	2/0	2/0					15.7				
17	1/0		2/0	2/0	2/0	2/0					16.3				
18	1/0		2/0	2/0	2/0	2/0					16.0				
19	1/0		2/0	2/0	2/0	2/0					16.9				
20	1/0		2/0	2/0	2/0	2/0					15.6				
21	1/0		2/0	2/0	2/0	2/0					17.7				
22	1/0		2/0	2/0	2/0	2/0					17.8				
23	1/0		2/0	2/0	2/0	2/0					16.7				
24	1/0		2/0	2/0	2/0	2/0					17.1				
25	1/0		2/0	2/0	2/0	2/0					16.6				
26	1/0		2/0	2/0	2/0	2/0					16.9				
27	1/0		2/0	2/0	2/0	2/0					15.9				
28	1/0		2/0	2/0	2/0	2/0					17.0				
29	1/0		2/0	2/0	2/0	2/0					15.3				
30	1/0		0/0	2/0	2/0	2/0					16.6				
											16.3				
											18.0				
											12.7				



Distribution System Monitoring

WSSN 2310

Nov-12

[illegible]



Distribution System Monitoring

WSSN 2310

Nov-12

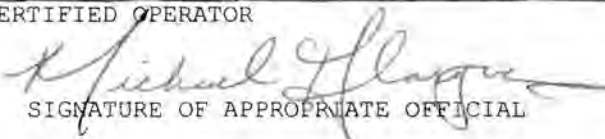
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Nov-12

Total number of positive routine samples: 0				Total Coliform: 0		Fecal Coliform: 0	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				162			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of October 2012

Flint Water Plant	2310	Genesee
NAME OF WATER SYSTEM	WSSN	COUNTY
Michael Glasgow	DEQ	F-1R S-3
CERTIFIED OPERATOR	RESOURCE MANAGEMENT DIVISION	CLASSIFICATION
	NOV 13 2012	
SIGNATURE OF APPROPRIATE OFFICIAL	LANSING DISTRICT	

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al3+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons
11. Total Power Cost per Million Gallons

Remarks:

* In September we began adding chlorine gas at our 3 MG Well to boost chlorine residuals in the distribution system, and to reduce our chlorine gas storage. On average we are increasing the residual by 0.5mg/L - 0.7mg/L at the 3 MG well, which has an average flow of 6 MGD. Chlorine addition continued until October 22nd.

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909



Coagulation Parameters

WSSN 2310

Oct-12

[illegible]



Flouridation & Chlorination

WSSN 2310

Oct-12

DATE	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) lbs/day	Post Chlorine (lbs/day)	B&P	Sta II	Dort	3MG Well	Tap			
		Free	Free	Free				Free	Free						
		14	15	16				17	18	19	20	21	22	23	24
1			0.70				30	0.7	0.8	0.7	1.4				1.1
2			0.76				30	0.8	0.9	0.8	1.3				0.9
3			0.75				30	0.8	0.9	0.8	1.3				0.9
4			0.74				30	0.7	0.9	0.8	1.4				0.9
5			0.74				30	0.7	0.8	0.8	1.3				1.0
6			0.73				30	0.8	0.8	0.7	1.4				0.9
7			0.76				30	0.7	0.8	0.6	1.2				0.8
8			0.75				40	0.9	0.8	0.6	1.5				1.0
9			0.80				38	0.7	0.8	0.6	1.4				0.7
10			0.77				38	0.7	0.8	0.7	1.4				0.9
11			0.70				40	0.7	0.7	0.7	1.4				0.9
12			0.76				40	0.7	0.8	0.8	1.4				0.8
13			0.75				40	0.8	0.9	0.8	1.6				1.2
14			0.72				40	0.8	0.8	0.7	1.3				1.0
15			0.77				40	0.8	0.9	0.8	1.4				1.1
16			0.76				40	0.9	0.8	0.8	1.4				0.9
17			0.73				40	0.9	0.8	0.8	1.4				0.9
18			0.76				40	0.7	0.8	0.7	1.4				0.9
19			0.76				40	0.8	0.8	0.8	1.5				1.0
20			0.74				40	0.8	0.8	0.8	1.5				1.1
21			0.78				40	0.7	0.8	0.7	1.3				1.0
22			0.71				10	0.8	0.8	0.7	1.3				0.9
23			0.72					0.7	0.9	0.8	0.8				0.8
24			0.74					0.8	0.9	0.7	0.8				0.9
25			0.68					0.8	1.0	0.8	0.7				0.8
26			0.74					0.8	0.8	0.8	0.8				0.9
27			0.62					0.7	0.8	0.7	0.8				0.7
28			0.69					0.7	0.8	0.7	0.8				0.7
29			0.75					0.8	0.8	0.7	0.7				0.8
30			0.74					0.6	0.8	0.7	0.7				0.7
31			0.74					0.8	0.8	0.7	0.7				0.7
AVG			0.74				35	0.8	0.8	0.7	1.2				0.9
MAX			0.80				40	0.9	1.0	0.8	1.6				1.2
MIN			0.62				10	0.6	0.7	0.6	0.7				0.7



Chemical Analyses

WSSN 2310

Oct-12

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.40		100		72		28				29.7		6.3		
2		7.37		98		72		26				29.7		5.8		
3		7.42		98		73		25				30.5		5.3		
4		7.41		98		75		23				29.7		5.8		
5		7.44		98		71		27				30.5		5.3		
6		7.45		102		72		30				27.3		8.3		
7		7.40		100		73		27				28.9		6.8		
8		7.37		100		70		30				30.5		5.8		
9		7.43		102		73		29				30.5		6.3		
10		7.41		96		74		22				28.9		5.8		
11		7.39		96		71		25				29.7		5.3		
12		7.34		98		68		30				28.9		6.3		
13		7.41		96		71		25				32.1		3.9		
14		7.30		100		73		27				28.9		6.8		
15		7.34		98		69		29				29.7		5.8		
16		7.47		96		74		22				29.7		5.3		
17		7.39		98		72		26				29.7		5.8		
18		7.41		98		74		24				28.9		6.3		
19		7.36		98		72		26				28.9		6.3		
20		7.36		96		74		22				29.7		5.3		
21		7.37		100		73		27				28.9		6.8		
22		7.33		100		74		26				29.7		6.3		
23		7.37		98		74		24				28.9		6.3		
24		7.41		100		74		26				28.9		6.8		
25		7.37		98		75		23				28.9		5.8		
26		7.40		98		74		24				29.7		5.8		
27		7.37		98		71		27				28.9		6.3		
28		7.28		100		72		28				29.7		6.3		
29		7.41		98		73		25				28.9		6.3		
30		7.41		98		69		29				29.7		5.8		
31		7.41		98		74		24				29.7		5.8		
AVG		7.39		98		72		26				29.5		6.0		
MAX		7.47		102		75		30				32.1		8.3		
MIN		7.28		96		68		22				27.3		3.9		



Bacteriological & Physical Parameters

WSSN 2310

Oct-12

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg. C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Sta II	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					20.5				
2	1/0		2/0	2/0	2/0	2/0					19.0				
3	1/0		2/0	2/0	2/0	2/0					18.6				
4	1/0		2/0	2/0	2/0	2/0					18.8				
5	1/0		2/0	2/0	2/0	2/0					18.9				
6	1/0		2/0	2/0	2/0	2/0					18.4				
7	1/0		2/0	2/0	2/0	2/0					18.5				
8	1/0		2/0	2/0	2/0	2/0					18.6				
9	1/0		2/0	2/0	2/0	2/0					19.0				
10	1/0		2/0	2/0	2/0	2/0					19.4				
11	1/0		2/0	2/0	2/0	2/0					18.9				
12	1/0		2/0	2/0	2/0	2/0					18.8				
13	1/0		2/0	2/0	2/0	2/0					18.8				
14	1/0		2/0	2/0	2/0	2/0					19.1				
15	1/0		2/0	2/0	2/0	2/0					19.2				
16	1/0		2/0	2/0	2/0	2/0					17.8				
17	1/0		2/0	2/0	2/0	2/0					17.9				
18	1/0		2/0	2/0	2/0	2/1					17.3				
19	1/0		2/0	2/0	2/0	2/0					17.3				
20	1/0		2/0	2/0	2/0	2/0					16.9				
21	1/0		2/0	2/0	2/0	2/0					17.0				
22	1/0		2/0	2/0	2/0	2/0					17.5				
23	1/0		2/0	2/0	2/0	2/0					17.1				
24	1/0		2/0	2/1	2/0	2/0					17.0				
25	1/0		2/0	2/0	2/0	2/0			< 2		17.1				
26	1/0		2/0	2/0	2/0	2/0					17.3				
27	1/0		2/0	2/0	2/0	2/0					16.1				
28	1/1		2/0	2/0	2/0	2/0					17.6				
29	1/0		2/0	2/0	2/0	2/0					16.9				
30	1/0		2/0	2/0	2/0	2/0					17.8				
31	1/0		2/0	2/0	2/0	2/0					18.0				
											18.1				
											20.5				
											16.1				



Distribution System Monitoring

WSSN 2310

Oct-12

DATE	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l												
	1	2	3	4	5	6	7	8	CS	WR	STA II AM	STA II PM	Number of Samples
1									0.4	0.8	0.7	0.9	4
2											0.9	0.9	2
3	0.6	0.9	0.7	0.6	0.5	0.6	1.0	1.1	0.4	0.8	0.8	0.9	12
4	0.7	1.0	0.7	0.6	0.6	0.7	0.9	1.1	0.4	0.7	0.8	0.9	12
5											0.7	0.8	2
6											0.8	0.8	2
7											0.8	0.8	2
8									0.8	1.0	0.7	0.8	4
9											0.8	0.8	2
10									0.4	0.9	0.8	0.8	4
11	0.7	1.0	1.0	0.8	0.7	0.9	0.9	1.0	0.5	0.9	0.7	0.7	12
12									0.4	0.8	0.8	0.8	4
13											0.9	0.9	2
14											0.8	0.8	2
15									0.5	0.8	0.9	0.9	4
16									0.9	1.1	0.8	0.8	4
17	0.7	0.7	0.8	0.9	0.5	0.5	0.8	1.0	0.4	0.4	0.8	0.8	12
18	0.7	1.0	0.8	0.9	0.4	0.5	0.7	1.1	0.4	0.3	0.8	0.8	12
19									0.2	0.2	0.8	0.8	4
20											0.8	0.8	2
21											0.8	0.8	2
22									0.6	0.7	0.8	0.8	4
23											0.9	0.9	2
24	0.6	0.6	0.5	0.5	0.3	0.3	0.7	0.8	0.5	0.0	0.9	0.8	12
25	0.8	0.6	0.5	0.5	0.3	0.5	0.6	0.8	0.4	0.0	0.9	1.0	12
26									0.6	0.0	0.8	0.8	4
27											0.7	0.8	2
28											0.7	0.9	2
29									0.3	0.4	0.7	0.8	4
30											0.8	0.7	2
31	0.6	0.4	0.4	0.3	0.3	0.3	0.6	0.8	0.3	0.5	0.8	0.7	12
Monthly Cl₂ Avg.				0.696									
Quarterly Cl₂ Avg.				0.617									
Yearly Cl₂ Avg.				0.626									
Total Samples				162									



Distribution System Monitoring

WSSN 2310

Oct-12

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Oct-12

Total number of positive routine samples: <u>4</u>				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
10/18/2012	Laboratory Tap	Present	Absent	10/19/2012	Laboratory Tap	Absent	Absent
				10/19/2012	Control Station # 2 (Sta 2)	Absent	Absent
				10/19/2012	Pump Station #4 (3 MG Well)	Absent	Absent
10/24/2012	Pump Station #4 (3 MG Well)	Present	Absent	10/25/2012	Pump Station #4 (3 MG Well)	Absent	Absent
				10/25/2012	Control Station # 2 (Sta 2)	Absent	Absent
				10/25/2012	Laboratory Tap	Absent	Absent
10/26/2012	West Side Reservoir & Pump Station (WS)	Present	Absent	10/27/2012	West Side Reservoir & Pump Station	Absent	Absent
				10/27/2012	Mid-way Market	Absent	Absent
				10/27/2012	Frazier's Accounting	Absent	Absent
10/28/2012	Baxter & Potter Rd. Control Station (B&P)	Present	Absent	10/29/2012	Baxter & Potter Rd. Control Station (B&P)	Absent	Absent
				10/29/2012	Up-stream	n/a	n/a
				10/29/2012	Control Station # 2 (Sta 2)	Absent	Absent
Total number of routine distribution samples analyzed:				162			
Total number of routine distribution samples required:				100			



Coagulation Parameters

WSSN 2310

Oct-12

DATE	Total Million Gallons Purchased	Million Gallons to County	Million Gallons to Flint	4	5	Ferric Chloride as Fe 3+ mg/l	Turbidity, NTU units						
							Raw				Plant Tap		
							# of Sample s	Avg.	Max		# of Samples	Avg.	Max
	1	1A	1B			6	7	8	9	10	11	12	13
1	23.29	11.63	11.65								3	0.10	0.12
2	23.01	11.67	11.34								3	0.10	0.10
3	23.01	12.07	10.95								3	0.10	0.10
4	21.53	10.83	10.70								3	0.13	0.14
5	22.85	11.79	11.06								3	0.09	0.09
6	23.03	12.10	10.93								3	0.09	0.09
7	23.21	12.00	11.20								3	0.10	0.11
8	23.12	11.38	11.74								3	0.11	0.12
9	21.93	10.68	11.25								3	0.08	0.08
10	21.96	10.23	11.73								3	0.11	0.13
11	21.81	10.30	11.51								3	0.08	0.08
12	22.41	10.04	12.37								3	0.07	0.08
13	21.07	10.89	10.18								3	0.10	0.14
14	21.91	10.40	11.51								3	0.09	0.11
15	21.50	10.07	11.43								3	0.13	0.24
16	21.72	10.03	11.69								3	0.08	0.09
17	19.69	11.12	8.57								3	0.09	0.09
18	18.72	11.65	7.07								3	0.08	0.09
19	18.34	11.21	7.13								3	0.08	0.09
20	19.42	10.74	8.68								3	0.08	0.08
21	20.52	10.15	10.37								3	0.09	0.10
22	20.47	10.69	9.78								3	0.09	0.10
23	20.53	10.09	10.44								3	0.10	0.11
24	20.31	9.40	10.91								3	0.13	0.16
25	22.10	10.07	12.03								3	0.11	0.12
26	22.69	10.84	11.84								3	0.10	0.11
27	21.82	11.69	10.13								3	0.12	0.13
28	21.33	11.37	9.96								3	0.11	0.12
29	22.17	10.08	12.09								3	0.12	0.14
30	20.50	10.48	10.02								3	0.13	0.16
31	21.51	10.07	11.44								3	0.13	0.15
AVG	21.53	10.83	10.70								3	0.10	0.11
MAX	23.29	12.10	12.37								3	0.13	0.24
MIN	18.34	9.40	7.07								3	0.07	0.08
Total	667.46	335.77	331.69										



Flouridation & Chlorination

WSSN 2310

Oct-12

D A T E	Fluorid e Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l								
						Chlorine (prior to filtration) lbs/day	Post Chlorin e (lbs/day)	B&P	Sta II	Dort	3MG Well		Tap			
		Raw	Tap	Dist					Free	Free	Free	Free			Free	
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		
1			0.70				30	0.7	0.8	0.7	1.4			1.1		
2			0.76				30	0.8	0.9	0.8	1.3			0.9		
3			0.75				30	0.8	0.9	0.8	1.3			0.9		
4			0.74				30	0.7	0.9	0.8	1.4			0.9		
5			0.74				30	0.7	0.8	0.8	1.3			1.0		
6			0.73				30	0.8	0.8	0.7	1.4			0.9		
7			0.76				30	0.7	0.8	0.6	1.2			0.8		
8			0.75				40	0.9	0.8	0.6	1.5			1.0		
9			0.80				38	0.7	0.8	0.6	1.4			0.7		
10			0.77				38	0.7	0.8	0.7	1.4			0.9		
11			0.70				40	0.7	0.7	0.7	1.4			0.9		
12			0.76				40	0.7	0.8	0.8	1.4			0.8		
13			0.75				40	0.8	0.9	0.8	1.6			1.2		
14			0.72				40	0.8	0.8	0.7	1.3			1.0		
15			0.77				40	0.8	0.9	0.8	1.4			1.1		
16			0.76				40	0.9	0.8	0.8	1.4			0.9		
17			0.73				40	0.9	0.8	0.8	1.4			0.9		
18			0.76				40	0.7	0.8	0.7	1.4			0.9		
19			0.76				40	0.8	0.8	0.8	1.5			1.0		
20			0.74				40	0.8	0.8	0.8	1.5			1.1		
21			0.78				40	0.7	0.8	0.7	1.3			1.0		
22			0.71				10	0.8	0.8	0.7	1.3			0.9		
23			0.72					0.7	0.9	0.8	0.8			0.8		
24			0.74					0.8	0.9	0.7	0.8			0.9		
25			0.68					0.8	1.0	0.8	0.7			0.8		
26			0.74					0.8	0.8	0.8	0.8			0.9		
27			0.62					0.7	0.8	0.7	0.8			0.7		
28			0.69					0.7	0.8	0.7	0.8			0.7		
29			0.75					0.8	0.8	0.7	0.7			0.8		
30			0.74					0.6	0.8	0.7	0.7			0.7		
31			0.74					0.8	0.8	0.7	0.7			0.7		
AVG			0.74				35	0.8	0.8	0.7	1.2			0.9		
MAX			0.80				40	0.9	1.0	0.8	1.6			1.2		
MIN			0.62				10	0.6	0.7	0.6	0.7			0.7		



Chemical Analyses

WSSN 2310

Oct-12

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.40		100		72		28				29.7		6.3		
2		7.37		98		72		26				29.7		5.8		
3		7.42		98		73		25				30.5		5.3		
4		7.41		98		75		23				29.7		5.8		
5		7.44		98		71		27				30.5		5.3		
6		7.45		102		72		30				27.3		8.3		
7		7.40		100		73		27				28.9		6.8		
8		7.37		100		70		30				30.5		5.8		
9		7.43		102		73		29				30.5		6.3		
10		7.41		96		74		22				28.9		5.8		
11		7.39		96		71		25				29.7		5.3		
12		7.34		98		68		30				28.9		6.3		
13		7.41		96		71		25				32.1		3.9		
14		7.30		100		73		27				28.9		6.8		
15		7.34		98		69		29				29.7		5.8		
16		7.47		96		74		22				29.7		5.3		
17		7.39		98		72		26				29.7		5.8		
18		7.41		98		74		24				28.9		6.3		
19		7.36		98		72		26				28.9		6.3		
20		7.36		96		74		22				29.7		5.3		
21		7.37		100		73		27				28.9		6.8		
22		7.33		100		74		26				29.7		6.3		
23		7.37		98		74		24				28.9		6.3		
24		7.41		100		74		26				28.9		6.8		
25		7.37		98		75		23				28.9		5.8		
26		7.40		98		74		24				29.7		5.8		
27		7.37		98		71		27				28.9		6.3		
28		7.28		100		72		28				29.7		6.3		
29		7.41		98		73		25				28.9		6.3		
30		7.41		98		69		29				29.7		5.8		
31		7.41		98		74		24				29.7		5.8		
AVG		7.39		98		72		26				29.5		6.0		
MAX		7.47		102		75		30				32.1		8.3		
MIN		7.28		96		68		22				27.3		3.9		



Bacteriological & Physical Parameters

WSSN 2310

Oct-12

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Sta II	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					20.5				
2	1/0		2/0	2/0	2/0	2/0					19.0				
3	1/0		2/0	2/0	2/0	2/0					18.6				
4	1/0		2/0	2/0	2/0	2/0					18.8				
5	1/0		2/0	2/0	2/0	2/0					18.9				
6	1/0		2/0	2/0	2/0	2/0					18.4				
7	1/0		2/0	2/0	2/0	2/0					18.5				
8	1/0		2/0	2/0	2/0	2/0					18.6				
9	1/0		2/0	2/0	2/0	2/0					19.0				
10	1/0		2/0	2/0	2/0	2/0					19.4				
11	1/0		2/0	2/0	2/0	2/0					18.9				
12	1/0		2/0	2/0	2/0	2/0					18.8				
13	1/0		2/0	2/0	2/0	2/0					18.8				
14	1/0		2/0	2/0	2/0	2/0					19.1				
15	1/0		2/0	2/0	2/0	2/0					19.2				
16	1/0		2/0	2/0	2/0	2/0					17.8				
17	1/0		2/0	2/0	2/0	2/0					17.9				
18	1/0		2/0	2/0	2/0	2/1					17.3				
19	1/0		2/0	2/0	2/0	2/0					17.3				
20	1/0		2/0	2/0	2/0	2/0					16.9				
21	1/0		2/0	2/0	2/0	2/0					17.0				
22	1/0		2/0	2/0	2/0	2/0					17.5				
23	1/0		2/0	2/0	2/0	2/0					17.1				
24	1/0		2/0	2/1	2/0	2/0					17.0				
25	1/0		2/0	2/0	2/0	2/0			< 2		17.1				
26	1/0		2/0	2/0	2/0	2/0					17.3				
27	1/0		2/0	2/0	2/0	2/0					16.1				
28	1/1		2/0	2/0	2/0	2/0					17.6				
29	1/0		2/0	2/0	2/0	2/0					16.9				
30	1/0		2/0	2/0	2/0	2/0					17.8				
31	1/0		2/0	2/0	2/0	2/0					18.0				
											18.1				
											20.5				
											16.1				

DATE	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l													
	1	2	3	4	5	6	7	8	CS	WR	STA II AM	STA II PM	Number of Samples	
1									0.4	0.8	0.7	0.9	4	
2											0.9	0.9	2	
3	0.6	0.9	0.7	0.6	0.5	0.6	1.0	1.1	0.4	0.8	0.8	0.9	12	
4	0.7	1.0	0.7	0.6	0.6	0.7	0.9	1.1	0.4	0.7	0.8	0.9	12	
5											0.7	0.8	2	
6											0.8	0.8	2	
7											0.8	0.8	2	
8									0.8	1.0	0.7	0.8	4	
9											0.8	0.8	2	
10									0.4	0.9	0.8	0.8	4	
11	0.7	1.0	1.0	0.8	0.7	0.9	0.9	1.0	0.5	0.9	0.7	0.7	12	
12									0.4	0.8	0.8	0.8	4	
13											0.9	0.9	2	
14											0.8	0.8	2	
15									0.5	0.8	0.9	0.9	4	
16									0.9	1.1	0.8	0.8	4	
17	0.7	0.7	0.8	0.9	0.5	0.5	0.8	1.0	0.4	0.4	0.8	0.8	12	
18	0.7	1.0	0.8	0.9	0.4	0.5	0.7	1.1	0.4	0.3	0.8	0.8	12	
19									0.2	0.2	0.8	0.8	4	
20											0.8	0.8	2	
21											0.8	0.8	2	
22									0.6	0.7	0.8	0.8	4	
23											0.9	0.9	2	
24	0.6	0.6	0.5	0.5	0.3	0.3	0.7	0.8	0.5	0.0	0.9	0.8	12	
25	0.8	0.6	0.5	0.5	0.3	0.5	0.6	0.8	0.4	0.0	0.9	1.0	12	
26									0.6	0.0	0.8	0.8	4	
27											0.7	0.8	2	
28											0.7	0.9	2	
29									0.3	0.4	0.7	0.8	4	
30											0.8	0.7	2	
31	0.6	0.4	0.4	0.3	0.3	0.3	0.6	0.8	0.3	0.5	0.8	0.7	12	
Monthly Cl₂ Avg.				0.696										
Quarterly Cl₂ Avg.				0.617										
Yearly Cl₂ Avg.				0.626										
Total Samples				162										

Oct-12

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Oct-12

Total number of positive routine samples: <u>4</u>				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
10/18/2012	Laboratory Tap	Present	Absent	10/19/2012	Laboratory Tap	Absent	Absent
				10/19/2012	Control Station # 2 (Sta 2)	Absent	Absent
				10/19/2012	Pump Station #4 (3 MG Well)	Absent	Absent
10/24/2012	Pump Station #4 (3 MG Well)	Present	Absent	10/25/2012	Pump Station #4 (3 MG Well)	Absent	Absent
				10/25/2012	Control Station # 2 (Sta 2)	Absent	Absent
				10/25/2012	Laboratory Tap	Absent	Absent
10/26/2012	West Side Reservoir & Pump Station (WS)	Present	Absent	10/27/2012	West Side Reservoir & Pump Station	Absent	Absent
				10/27/2012	Mid-way Market	Absent	Absent
				10/27/2012	Frazier's Accounting	Absent	Absent
10/28/2012	Baxter & Potter Rd. Control Station (B&P)	Present	Absent	10/29/2012	Baxter & Potter Rd. Control Station (B&P)	Absent	Absent
				10/29/2012	Up-stream	n/a	n/a
				10/29/2012	Control Station # 2 (Sta 2)	Absent	Absent
Total number of routine distribution samples analyzed:				162			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

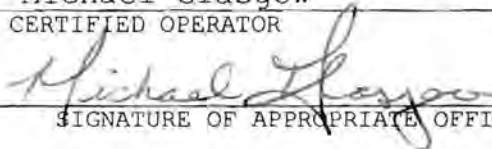
 ENTERED
For Month of September 2012
Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION


SIGNATURE OF APPROPRIATE OFFICIAL

 DEQ
RESOURCE MANAGEMENT DIVISION
TREATMENT RATE AND FILTER DATA

OCT 12 2012

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

LANSING DISTRICT

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al3+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

* On September 26th we began adding chlorine gas at our 3 MG Well to boost chlorine residuals in the distribution system, and to reduce our chlorine gas storage. On average we are increasing the residual by 0.5mg/L - 0.7mg/L at the 3 MG well, which has an average flow of 6 MGD.

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909



Sep-12

[illegible]



Flouridation & Chlorination

WSSN 2310

Sep-12

D A T E	Fluorid e Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine (3MG Well) mg/L	B&P	Sta II	Dort	3MG Well	Tap			
		Free	Free	Free				Free	Free						
		14	15	16				17	18	19	20	21	22	23	24
1			0.65					0.8	1.0	0.6	0.8			0.8	
2			n/a					n/a	n/a	n/a	n/a			n/a	
3			0.69					0.8	0.9	0.7	0.8			0.8	
4			0.69					0.9	1.0	0.8	0.8			0.9	
5			0.69					1.1	1.0	0.8	0.8			1.0	
6			0.66					1.0	1.0	0.7	0.8			1.0	
7			0.68					1.0	1.0	0.8	0.8			1.0	
8			0.71					0.8	0.9	0.8	0.8			0.9	
9			0.69					0.8	0.9	0.8	0.7			0.7	
10			0.67					0.8	0.8	0.8	0.8			0.7	
11			0.71					0.8	0.8	0.6	0.7			0.8	
12			0.74					0.9	0.8	0.8	0.7			0.8	
13			0.71					0.7	0.9	0.6	0.7			0.7	
14			0.76					0.9	0.9	0.7	0.8			1.0	
15			0.74					0.8	0.9	0.8	0.8			1.0	
16			0.74					0.7	0.9	0.7	0.7			0.8	
17			0.72					0.8	0.8	0.7	0.8			0.7	
18			0.73					0.9	0.9	0.7	0.8			0.8	
19			0.74					0.8	0.8	0.6	0.7			0.8	
20			0.69					0.7	0.8	0.7	0.7			0.7	
21			0.72					0.8	0.8	0.7	0.7			0.7	
22			0.64					0.8	0.8	0.7	0.8			0.7	
23			0.68					0.8	1.0	0.6	0.7			0.8	
24			0.70					0.9	0.7	0.8	0.8			0.9	
25			0.71					0.9	0.9	0.8	0.8			0.9	
26			0.69				35	1.0	0.9	0.7	1.2			0.8	
27			0.68				35	0.7	0.9	0.8	1.5			1.1	
28			0.73				35	0.9	0.9	0.8	1.5			1.0	
29			0.73				35	0.9	1.0	0.9	1.5			1.1	
30			0.64				32	0.8	1.0	0.8	1.4			1.0	
AVG			0.70				34	0.8	0.9	0.7	0.9			0.9	
MAX			0.76				35	1.1	1.0	0.9	1.5			1.1	
MIN			0.64				32	0.7	0.7	0.6	0.7			0.7	



Chemical Analyses

WSSN 2310

Sep-12

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.30		100		72		28				29.7		6.3		
2		n/a		n/a		n/a		n/a				n/a		n/a		
3		7.27		100		70		30				29.7		6.3		
4		7.43		100		73		27				29.7		6.3		
5		7.44		98		72		26				29.7		5.8		
6		7.39		98		72		26				30.5		5.3		
7		7.40		100		73		27				28.1		7.3		
8		7.41		98		72		26				26.5		7.8		
9		7.32		98		71		27				28.9		6.3		
10		7.44		100		72		28				29.7		6.3		
11		7.42		100		74		26				28.9		6.8		
12		7.49		100		72		28				29.7		6.3		
13		7.36		98		71		27				29.7		5.3		
14		7.51		98		69		29				28.9		6.3		
15		7.44		102		72		30				27.3		8.3		
16		7.23		98		72		26				28.9		6.3		
17		7.32		98		72		26				28.9		6.3		
18		7.40		98		72		26				29.7		5.8		
19		7.34		100		74		26				30.5		5.8		
20		7.44		100		71		29				28.9		6.8		
21		7.36		98		72		26				28.9		6.3		
22		7.26		100		73		27				30.5		5.8		
23		7.28		100		69		31				29.7		6.3		
24		7.35		96		73		23				29.7		5.3		
25		7.37		98		72		26				30.5		5.3		
26		7.43		98		69		29				29.7		5.8		
27		7.62		98		72		26				28.9		6.3		
28		7.35		98		71		27				30.5		5.3		
29		7.37		96		72		24				29.7		5.3		
30		7.34		100		70		30				28.9		6.8		
AVG		7.38		99		72		27				29.3		6.2		
MAX		7.62		102		74		31				30.5		8.3		
MIN		7.23		96		69		23				26.5		5.3		



Bacteriological & Physical Parameters

WSSN 2310

Sep-12

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Sta II	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					23.3				
2	0/0		0/0	0/0	0/0	0/0					n/a				
3	1/0		2/0	2/0	2/0	2/0					22.2				
4	1/0		2/0	2/0	2/0	2/0					22.2				
5	1/0		2/0	2/0	2/0	2/0					22.7				
6	1/0		2/0	2/0	2/0	2/0					22.3				
7	1/0		2/0	2/0	2/0	2/0					22.2				
8	1/0		2/0	2/0	2/0	2/0					21.7				
9	1/0		2/0	2/0	2/0	2/0					22.4				
10	1/0		2/0	2/0	2/0	2/0					22.2				
11	1/0		2/0	2/0	2/0	2/0					22.0				
12	1/0		2/0	2/0	2/0	2/0					22.1				
13	1/0		2/0	2/0	2/0	2/0			< 2		21.8				
14	1/0		2/0	2/0	2/0	2/0					21.8				
15	1/0		2/0	2/0	2/0	2/0					21.0				
16	1/0		2/0	2/0	2/0	2/0					21.4				
17	1/0		2/0	2/0	2/0	2/0					22.1				
18	1/0		2/0	2/0	2/0	2/0					22.0				
19	1/0		2/0	2/0	2/0	2/0					22.5				
20	1/0		2/0	2/0	2/0	2/0					20.9				
21	1/0		2/0	2/0	2/0	2/0					20.7				
22	1/0		2/0	2/0	2/0	2/0					20.7				
23	1/0		2/0	2/0	2/0	2/0					20.2				
24	1/0		2/0	2/0	2/0	2/0					19.6				
25	1/0		2/0	2/0	2/0	2/0					19.6				
26	1/0		2/0	2/0	2/0	2/0					19.8				
27	1/0		2/0	2/0	2/0	2/0					20.0				
28	1/0		2/0	2/0	2/0	2/0					19.4				
29	1/0		2/0	2/0	2/0	2/0					19.2				
30	1/0		2/0	2/0	2/0	2/0					19.4				
											21.3				
											23.3				
											19.2				



Distribution System Monitoring

WSSN 2310

Sep-12

[illegible]



Distribution System Monitoring

WSSN 2310

Sep-12

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Sep-12

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				160			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of August 2012

 ENTERED

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

DEQ
RESOURCE MANAGEMENT DIVISION

F-1R S-3
CLASSIFICATION

Michael Glasgow
SIGNATURE OF APPROPRIATE OFFICIAL

SEP 13 2012

LANSING DISTRICT

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MP

[illegible]



Flouridation & Chlorination

WSSN 2310

Aug-12

DATE	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Static	Dort	3MG Well	Tap			
		Free	Free	Free				Free			Free				
		14	15	16				17	18	19	20	21	22	23	24
1			0.75					0.8	0.8	0.8	0.8				0.9
2			0.74					0.7	0.8	0.7	0.8				0.7
3			0.77					0.8	0.8	0.8	0.7				0.9
4			0.74					0.8	0.9	0.7	0.8				0.8
5			0.70					0.7	0.8	0.7	0.8				0.8
6			0.71					0.9	0.9	0.8	0.7				0.9
7			0.67					0.8	0.9	0.6	0.6				0.8
8			0.66					0.9	0.9	0.6	0.6				0.9
9			0.68					0.8	0.9	0.5	0.6				0.8
10			0.64					1.0	1.0	0.5	0.6				1.0
11			0.67					0.9	1.0	0.5	0.6				1.0
12			0.68					0.8	0.9	0.7	0.7				0.7
13			0.67					0.8	0.9	0.7	0.7				0.8
14			0.66					0.7	0.9	0.7	0.8				0.8
15			0.66					0.8	0.9	0.7	0.7				0.8
16			0.67					0.8	0.9	0.7	0.7				0.8
17			0.70					0.8	0.9	0.8	0.8				0.9
18			0.67					1.0	0.9	0.7	0.7				1.0
19			0.63					0.8	0.8	0.8	0.8				0.9
20			0.64					0.9	0.9	0.8	0.7				0.8
21			0.55					0.8	0.9	0.8	0.7				0.9
22			0.65					0.8	0.9	0.8	0.8				0.9
23			0.64					0.9	1.0	0.9	0.8				0.9
24			0.68					0.9	1.0	0.9	0.8				1.0
25			0.65					0.9	0.9	0.8	0.7				0.9
26			0.62					0.7	0.9	0.8	0.7				0.8
27			0.64					0.8	0.8	0.8	0.8				0.8
28			0.69					0.9	0.8	0.8	0.8				0.7
29			0.65					0.8	0.8	0.7	0.8				0.8
30			0.68					0.8	0.9	0.7	0.8				0.7
31			0.69					0.9	0.9	0.8	0.7				1.0
AVG			0.67					0.8	0.9	0.7	0.7				0.9
MAX			0.77					1.0	1.0	0.9	0.8				1.0
MIN			0.55					0.7	0.8	0.5	0.6				0.7



Chemical Analyses

WSSN 2310

Aug-12

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.46		94		73		21				28.1		5.8		
2		7.43		96		71		25				28.9		5.8		
3		7.46		94		69		25				28.1		5.8		
4		7.46		98		73		25				27.3		7.3		
5		7.47		98		71		27				28.9		6.3		
6		7.44		98		73		25				28.1		6.8		
7		7.42		98		72		26				28.9		6.3		
8		7.48		98		73		25				28.9		6.3		
9		7.43		98		71		27				28.9		6.3		
10		7.45		96		72		24				28.1		6.3		
11		7.51		96		71		25				28.1		6.3		
12		7.28		96		72		24				28.9		5.8		
13		7.60		96		73		23				29.7		5.3		
14		7.28		96		73		23				30.5		4.9		
15		7.50		96		72		24				29.7		5.3		
16		7.38		98		69		29				28.9		6.3		
17		7.44		98		72		26				28.9		6.3		
18		7.38		100		72		28				28.1		7.3		
19		7.26		98		72		26				29.7		5.8		
20		7.61		100		72		28				29.7		6.3		
21		7.34		98		75		23				29.7		5.3		
22		7.49		98		74		24				30.5		5.3		
23		7.43		98		72		26				29.7		5.8		
24		7.45		96		72		24				27.3		6.8		
25		7.35		96		72		24				26.5		7.3		
26		7.45		100		72		28				30.5		5.8		
27		7.45		98		71		27				29.7		5.8		
28		7.31		98		73		25				29.7		5.8		
29		7.52		98		73		25				29.7		5.8		
30		7.47		98		74		24				29.7		5.8		
31		7.39		100		69		31				29.7		6.3		
AVG		7.43		97		72		25				29.0		6.1		
MAX		7.61		100		75		31				30.5		7.3		
MIN		7.26		94		69		21				26.5		4.9		



Bacteriological & Physical Parameters

WSSN 2310

Aug-12

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Sta II	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					22.2				
2	1/0		2/0	2/0	2/0	2/0					22.3				
3	1/0		2/0	2/0	2/0	2/0					22.1				
4	1/0		2/0	2/0	2/0	2/0					22.4				
5	1/0		2/0	2/0	2/0	2/0					22.5				
6	1/0		2/0	2/0	2/0	2/0					22.5				
7	1/0		2/0	2/0	2/0	2/0					22.6				
8	1/0		2/0	2/0	2/0	2/0					21.5				
9	1/0		2/0	2/0	2/0	2/0		< 2			22.2				
10	1/0		2/0	2/0	2/0	2/0					21.3				
11	1/0		2/0	2/0	2/0	2/0					20.7				
12	1/0		2/0	2/0	2/0	2/0					21.5				
13	1/0		2/0	2/0	2/0	2/0					21.7				
14	1/0		2/0	2/0	2/0	2/0					21.7				
15	1/0		2/0	2/0	2/0	2/0					22.0				
16	1/0		2/0	2/0	2/0	2/0					22.0				
17	1/0		2/0	2/0	2/0	2/0					23.0				
18	1/0		2/0	2/0	2/0	2/0					21.5				
19	1/0		2/0	2/0	2/0	2/0					24.0				
20	1/0		2/0	2/0	2/0	2/0					22.1				
21	1/0		2/0	2/0	2/0	2/0					21.7				
22	1/0		2/0	2/0	2/0	2/0					21.9				
23	1/0		2/0	2/0	2/0	2/0					21.7				
24	1/0		2/0	2/0	2/0	2/0					24.6				
25	1/0		2/0	2/0	2/0	2/0					24.4				
26	1/0		2/0	2/0	2/0	2/0					22.1				
27	1/0		2/0	2/0	2/0	2/0					22.2				
28	1/0		2/0	2/0	2/0	2/0					21.7				
29	1/0		2/0	2/0	2/0	2/0					22.2				
30	1/0		2/0	2/0	2/0	2/0					21.8				
31	1/0		2/0	2/0	2/0	2/0					21.9				
											22.2				
											24.6				
											20.7				



Distribution System Monitoring

WSSN 2310

Aug-12

[illegible]



WSSN 2310

Aug-12

[illegible]

Aug-12

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				175			
Total number of routine distribution samples required:				100			

**MONTHLY OPERATION REPORT
OF
WATER TREATMENT PLANT**

For Month of July 2012

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION


SIGNATURE OF APPROPRIATE OFFICIAL

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al3+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

* On July 3rd we experienced high turbidities from the plant tap. This was most likely a small slug from Baxter & Potter Rd. as a result of switching from our 36" to our 60" pipe on July 2nd. Chlorine residuals were good, and extra bacteria samples were collected. All bacteria samples were absent. On July 4th turbidity values were back at usual levels.

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909



Coagulation Parameters

WSSN 2310

Jul-12

[illegible]

Meter Pits off 72" City of Flint Transmission Main

Daily Average

July-12

Date:	Henderson	Oak & Potter	M-15 & Potter	Irish & Potter	Belsay & Potter	S. Genesee	
1	9.77	0.83	0.23	2.32	1.11	10.12	24.38
2	8.01	0.84	0.24	2.34	1.11	10.20	22.74
3	8.00	0.90	0.19	2.42	1.11	10.66	27.28
4	8.11	0.80	0.07	2.32	1.14	9.83	22.27
5	6.85	0.88	0.15	2.56	1.16	6.18	17.78
6	5.65	0.87	0.16	2.57	1.16	4.88	15.29
7	8.29	0.87	0.15	2.51	1.15	7.07	20.04
8	8.38	0.76	0.14	2.19	1.03	11.57	29.07
9	4.87	0.82	0.25	2.45	1.03	7.41	16.83
10	5.86	0.83	0.20	2.39	1.20	10.01	20.49
11	7.86	0.86	0.21	2.48	1.30	8.42	21.13
12	8.93	0.91	0.23	2.61	1.46	7.20	21.34
13	9.27	0.89	0.22	2.51	1.41	9.33	23.63
14	8.95	0.86	0.20	2.43	1.15	10.52	24.11
15	8.53	0.87	0.18	2.47	1.23	10.96	24.21
16	6.90	0.87	0.18	2.50	1.22	10.58	22.25
17	6.40	0.83	0.18	2.31	1.16	10.46	21.94
18	8.53	0.86	0.15	2.42	1.30	10.42	23.68
19	8.06	0.86	0.11	2.53	1.53	8.12	21.21
20	5.83	0.81	0.13	2.61	1.61	5.94	16.93
21	4.95	0.77	0.11	2.49	1.41	6.05	15.78
22	5.29	0.80	0.14	2.41	1.24	7.92	17.8
23	5.26	0.76	0.13	2.30	1.16	9.71	19.35
24	5.59	0.79	0.14	2.32	1.10	9.85	19.79
25	5.58	0.81	0.17	2.37	1.20	9.63	19.76
26	5.56	0.86	0.17	2.51	1.26	9.04	19.04
27	6.92	0.81	0.10	2.47	1.45	6.78	18.33
28	6.57	0.79	0.09	2.46	1.37	5.77	17.05
29	4.76	0.77	0.12	2.58	1.52	5.86	15.61
30	3.81	0.64	0.12	2.50	1.51	6.52	15.10
31	3.80	0.59	0.12	2.24	1.24	7.84	15.83

Totals: 211.14 25.41 4.98 75.59 39.03 264.85

**Flouridation & Chlorination****WSSN 2310****Jul-12**

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l											
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well	Tap							
		Raw	Tap	Dist								Free	Free	Free	Free			Free	
1			n/a					0.8	0.8	0.5	0.4				0.7				
2			0.69					0.7	0.9	0.4	0.5				0.9				
3			0.67					0.8	9.0	0.5	0.6				0.8				
4			0.70					0.7	0.8	0.4	0.5				0.7				
5			0.39					0.7	0.9	0.5	0.6				0.7				
6			0.60					0.8	0.8	0.4	0.4				0.7				
7			0.66					0.7	0.9	0.4	0.4				0.8				
8			0.64					0.8	0.9	0.5	0.3				0.8				
9			0.68					0.8	0.9	0.4	0.4				0.8				
10			0.65					0.7	0.8	0.4	0.4				0.7				
11			0.65					0.9	0.8	0.4	0.5				0.8				
12			0.60					0.8	0.9	0.5	0.6				0.7				
13			0.65					0.8	0.9	0.5	0.7				0.8				
14			0.62					0.9	0.9	0.5	0.8				0.9				
15			0.65					0.7	0.9	0.6	0.7				0.7				
16			0.80					0.9	0.9	0.7	0.7				0.8				
17			0.87					0.8	0.9	0.6	0.7				0.8				
18			0.84					1.0	1.0	0.8	0.8				0.9				
19			0.72					0.8	1.0	0.8	0.9				0.9				
20			0.69					0.9	1.0	0.9	0.9				1.1				
21			0.59					1.0	1.0	0.9	0.9				1.0				
22			0.71					0.8	1.1	0.7	0.9				0.8				
23			0.69					0.9	0.9	0.8	0.8				0.9				
24			0.67					0.7	1.0	0.7	0.8				0.8				
25			0.74					1.0	1.0	0.8	0.8				0.8				
26			0.76					1.0	0.9	0.7	0.8				0.9				
27			0.82					0.8	1.0	0.7	0.8				0.9				
28			0.73					0.7	0.8	0.6	0.7				0.8				
29			0.72					0.8	0.8	0.8	0.8				0.8				
30			0.76					0.8	0.9	0.8	0.8				0.9				
31			0.74					0.8	0.9	0.8	0.9				0.9				
AVG			0.69					0.8	1.2	0.6	0.7				0.8				
MAX			0.87					1.0	9.0	0.9	0.9				1.1				
MIN			0.39					0.7	0.8	0.4	0.3				0.7				



Chemical Analyses

WSSN 2310

Jul-12

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		n/a		n/a		n/a		n/a				n/a		n/a		
2		7.44		96		73		23				28.9		5.8		
3		7.45		98		73		25				29.7		5.8		
4		7.30		98		74		24				28.9		6.3		
5		7.36		98		70		28				28.1		6.3		
6		7.30		98		74		24				28.9		6.3		
7		7.31		98		73		25				29.7		5.8		
8		7.44		98		71		27				29.7		5.8		
9		7.38		96		70		26				29.7		5.3		
10		7.51		96		74		22				29.7		5.3		
11		7.51		96		71		25				29.7		5.3		
12		7.40		98		71		27				28.9		5.3		
13		7.40		94		71		23				28.1		5.8		
14		7.42		98		74		24				28.1		6.8		
15		7.24		98		73		25				29.7		5.8		
16		7.41		98		74		24				29.7		5.8		
17		7.43		96		72		24				29.7		5.3		
18		7.50		96		73		23				28.9		5.8		
19		7.38		96		71		25				28.9		5.8		
20		7.45		98		71		27				28.9		6.3		
21		7.45		100		72		28				28.9		6.8		
22		7.32		100		74		26				28.9		6.8		
23		7.44		98		72		26				29.7		5.8		
24		7.42		98		73		25				28.9		6.3		
25		7.48		98		72		26				28.9		6.3		
26		7.48		100		73		27				28.9		6.8		
27		7.43		98		72		26				28.9		6.3		
28		7.29		98		74		24				29.7		5.8		
29		7.25		98		72		26				28.9		6.3		
30		7.44		98		72		26				28.9		6.3		
31		7.47		98		68		30				27.3		7.3		
AVG		7.40		98		72		25				29.1		6.1		
MAX		7.51		100		74		30				29.7		7.3		
MIN		7.24		94		68		22				27.3		5.3		



Bacteriological & Physical Parameters

WSSN 2310

Jul-12

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Sta II	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		0/0	0/0	0/0	0/0					n/a				
2	1/0		2/0	2/0	2/0	2/0					20.1				
3	2/0		2/0	2/0	2/0	2/0					19.9				
4	1/0		2/0	2/0	2/0	2/0					21.4				
5	1/0		2/0	2/0	2/0	2/0					21.2				
6	1/0		2/0	2/0	2/0	2/0					21.6				
7	1/0		2/0	2/0	2/0	2/0					21.5				
8	1/0		2/0	2/0	2/0	2/0					20.5				
9	1/0		2/0	2/0	2/0	2/0					19.9				
10	1/0		2/0	2/0	2/0	2/0					20.2				
11	1/0		2/0	2/0	2/0	2/0					20.9				
12	1/0		2/0	2/0	2/0	2/0					21.7				
13	1/0		2/0	2/0	2/0	2/0					21.8				
14	1/0		2/0	2/0	2/0	2/0					23.3				
15	1/0		2/0	2/0	2/0	2/0					22.4				
16	1/0		2/0	2/0	2/0	2/0					22.5				
17	1/0		2/0	2/0	2/0	2/0					21.9				
18	1/0		2/0	2/0	2/0	2/0			< 2		21.4				
19	1/0		2/0	2/0	2/0	2/0					20.7				
20	1/0		2/0	2/0	2/0	2/0					20.3				
21	1/0		2/0	2/0	2/0	2/0					20.3				
22	1/0		2/0	2/0	2/0	2/0					20.7				
23	1/0		2/0	2/0	2/0	2/0					21.7				
24	1/0		2/0	2/0	2/0	2/0					21.9				
25	1/0		2/0	2/0	2/0	2/0					21.4				
26	1/0		2/0	2/0	2/0	2/0					21.0				
27	1/0		2/0	2/0	2/0	2/0					21.5				
28	1/0		2/0	2/0	2/0	2/0					21.8				
29	1/0		2/0	2/0	2/0	2/0					21.8				
30	1/0		2/0	2/0	2/0	2/0					22.3				
31	1/0		2/0	2/0	2/0	2/0					22.5				
											21.3				
											23.3				
											19.9				



Distribution System Monitoring WSSN 2310 Jul-12

[illegible]



Distribution System Monitoring WSSN 2310 Jul-12

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				149			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

DEQ
RESOURCE MANAGEMENT DIVISION

JUL 12 2012

For Month of June 2012

ENTERED

LANSING DISTRICT

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION

Michael Glasgow
SIGNATURE OF APPROPRIATE OFFICIAL

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al3+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MD

Jun-12

[illegible]



Flouridation & Chlorination

WSSN 2310

Jun-12

DATE	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well	Tap			
		Raw	Tap	Dist				Free	Free	Free	Free			Free	
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.75					0.8	0.7	0.6	0.7			0.8	
2			0.74					0.6	0.8	0.7	0.6			0.7	
3			0.71					0.7	0.8	0.7	0.6			0.7	
4			0.72					0.7	0.7	0.5	0.5			0.7	
5			0.73					0.6	0.7	0.5	0.6			0.6	
6			0.72					0.8	0.8	0.5	0.5			0.8	
7			0.70					0.6	0.8	0.5	0.5			0.7	
8			0.70					0.8	0.7	0.5	0.5			0.8	
9			0.71					0.8	0.8	0.5	0.6			0.8	
10			0.67					0.5	0.8	0.5	0.5			0.8	
11			0.64					0.7	0.8	0.5	0.5			0.7	
12			0.67					0.8	0.8	0.5	0.5			0.7	
13			0.71					0.7	0.7	0.4	0.5			0.7	
14			0.66					0.7	0.7	0.4	0.5			0.7	
15			0.70					0.7	0.8	0.4	0.5			0.9	
16			0.71					0.8	0.7	0.5	0.5			0.7	
17			0.67					0.8	0.7	0.5	0.4			0.6	
18			0.69					0.7	0.8	0.5	0.5			0.7	
19			0.69					0.7	0.8	0.4	0.4			0.7	
20			0.67					0.8	0.8	0.4	0.4			0.7	
21			0.69					0.7	0.8	0.4	0.4			0.9	
22			0.67					0.8	0.8	0.4	0.4			0.9	
23			0.69					0.8	0.9	0.4	0.4			0.9	
24			0.60					0.7	0.9	0.4	0.4			0.8	
25			0.67					0.7	0.8	0.4	0.4			0.5	
26			0.60					0.8	0.9	0.5	0.4			0.8	
27			0.68					0.7	0.9	0.4	0.4			0.8	
28			0.67					0.8	0.8	0.4	0.5			0.8	
29			0.68					0.7	0.8	0.4	0.5			0.8	
30			0.68					0.9	0.8	0.4	0.5			0.9	
AVG			0.69					0.7	0.8	0.5	0.5			0.8	
MAX			0.75					0.9	0.9	0.7	0.7			0.9	
MIN			0.60					0.5	0.7	0.4	0.4			0.5	



Chemical Analyses

WSSN 2310

Jun-12

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.40		100		72		28				29.7		6.3		
2		7.40		98		71		27				29.7		5.8		
3		7.31		98		75		23				29.7		5.8		
4		7.45		98		74		24				28.9		6.3		
5		7.41		98		70		28				28.9		6.3		
6		7.42		98		72		26				30.5		5.3		
7		7.60		98		70		28				29.7		5.8		
8		7.43		98		72		26				28.9		6.3		
9		7.43		96		71		25				28.9		5.8		
10		7.42		98		71		27				29.7		5.8		
11		7.42		98		69		29				29.7		5.8		
12		7.38		98		72		26				29.7		5.8		
13		7.37		98		71		27				28.9		6.3		
14		7.54		98		72		26				29.7		5.8		
15		7.41		94		70		24				28.1		5.8		
16		7.46		96		71		25				28.9		5.8		
17		7.53		96		64		32				26.5		7.3		
18		7.44		98		74		24				29.7		5.8		
19		7.47		98		71		27				29.7		5.8		
20		7.46		98		72		26				29.7		5.8		
21		7.46		90		68		22				24.0		7.3		
22		7.50		94		71		23				28.1		5.8		
23		7.45		94		71		23				28.1		5.8		
24		7.34		98		68		30				29.7		5.8		
25		7.43		98		72		26				29.7		5.8		
26		7.61		98		74		24				29.7		5.8		
27		7.42		98		70		28				30.5		5.3		
28		7.42		94		71		23				28.9		5.3		
29		7.43		98		70		28				29.7		5.8		
30		7.41		92		71		21				28.1		5.3		
AVG		7.44		97		71		26				29.1		5.9		
MAX		7.61		100		75		32				30.5		7.3		
MIN		7.31		90		64		21				24.0		5.3		

**Bacteriological & Physical Parameters****WSSN 2310****Jun-12**

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Sta II	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					15.1				
2	1/0		2/0	2/0	2/0	2/0					14.5				
3	1/0		2/0	2/0	2/0	2/0					14.9				
4	1/0		2/0	2/0	2/0	2/0					15.8				
5	1/0		2/0	2/0	2/0	2/0					15.7				
6	1/0		2/0	2/0	2/0	2/0					16.2				
7	1/0		2/0	2/0	2/0	2/0					15.8				
8	1/0		2/0	2/0	2/0	2/0					15.3				
9	1/0		2/0	2/0	2/0	2/0					16.5				
10	1/0		2/0	2/0	2/0	2/0					16.1				
11	1/0		2/0	2/0	2/0	2/0					16.3				
12	1/0		2/0	2/0	2/0	2/0					16.1				
13	1/0		2/0	2/0	2/0	2/0					16.7				
14	1/0		2/0	2/0	2/0	2/0					16.0				
15	1/0		2/0	2/0	2/0	2/0					17.1				
16	1/0		2/0	2/0	2/0	2/0					17.0				
17	1/0		2/0	2/0	2/0	2/0					17.2				
18	1/0		2/0	2/0	2/0	2/0					18.0				
19	1/0		2/0	2/0	2/0	2/0					18.9				
20	1/0		2/0	2/0	2/0	2/0					18.7				
21	1/0		2/0	2/0	2/0	2/0					18.4				
22	1/0		2/0	2/0	2/0	2/0					18.8				
23	1/0		2/0	2/0	2/0	2/0					17.8				
24	1/0		2/0	2/0	2/0	2/0					17.7				
25	1/0		2/0	2/0	2/0	2/0					17.0				
26	1/0		2/0	2/0	2/0	2/0					17.9				
27	1/0		2/0	2/0	2/0	2/0									
28	1/0		2/0	2/0	2/0	2/0					19.5				
29	1/0		2/0	2/0	2/0	2/0					21.6				
30	1/0		2/0	2/0	2/0	2/0					21.2				
											17.2				
											21.6				
											14.5				



Distribution System Monitoring

WSSN 2310

Jun-12

[illegible]

Jun-12

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Jun-12

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				156			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of May 2012

Flint Water Plant
NAME OF WATER SYSTEM

2310

Genesee
COUNTY

DEQ
RESOURCE MANAGEMENT DIVISION

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION

JUN 13 2012

Michael Glasgow
SIGNATURE OF APPROPRIATE OFFICIAL

LANSING DISTRICT

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al3+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MP



Coagulation Parameters

WSSN 2310

May-12

[illegible]

**Flouridation & Chlorination****WSSN 2310****May-12**

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well	Tap			
		Raw	Tap	Dist				Free	Free	Free	Free			Free	
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.64					0.8	0.8	n/a	0.9			0.8	
2			0.66					0.9	n/a	n/a	1.0			0.9	
3			0.63					0.8	n/a	n/a	1.0			0.8	
4			0.67					0.8	0.9	n/a	1.0			1.0	
5			0.67					0.9	1.1	0.9	1.1			1.1	
6			0.60					0.8	0.9	0.9	1.0			0.9	
7			0.63					0.9	1.0	1.0	1.0			0.9	
8			0.62					0.8	1.0	0.9	1.0			1.0	
9			0.68					0.8	0.9	0.9	1.0			0.8	
10			0.63					0.8	0.9	0.9	0.9			0.8	
11			0.67					0.8	0.9	0.9	1.0			0.9	
12								0.8	0.9	0.9	1.0			0.9	
13			0.67					0.7	0.8	0.9	0.9			0.8	
14			0.68					0.7	0.7	0.8	0.8			0.8	
15			0.65					0.6	0.8	0.7	0.8			0.7	
16			0.66					0.7	0.7	0.8	0.8			0.8	
17			0.64					0.6	0.7	0.7	0.8			0.7	
18			0.69					0.7	0.7	0.7	0.8			0.8	
19			0.74					0.7	0.7	0.7	0.7			0.8	
20			0.71					0.8	0.7	0.7	0.7			0.7	
21			0.71					0.8	0.7	0.7	0.7			0.6	
22			0.70					0.8	0.8	0.8	0.8			0.7	
23			0.71					0.7	0.8	0.7	0.7			0.7	
24			0.76					0.8	0.8	0.7	0.8			0.8	
25			0.71					0.7	0.8	0.7	0.7			0.8	
26			0.69					0.9	0.8	0.7	0.7			0.7	
27			0.69					0.6	0.8	0.7	0.7			0.7	
28			0.73					0.6	0.7	0.7	0.6			0.7	
29			0.72					0.7	0.7	0.7	0.7			0.7	
30			0.68					0.7	0.8	0.6	0.6			0.7	
31			0.70					0.6	0.7	0.6	0.6			0.7	
AVG			0.68					0.8	0.8	0.8	0.8			0.8	
MAX			0.76					0.9	1.1	1.0	1.1			1.1	
MIN			0.60					0.6	0.7	0.6	0.6			0.6	



Chemical Analyses

WSSN 2310

May-12

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.38		100		73		27				30.5		5.8		
2		7.35		98		74		24				31.3		4.9		
3		7.39		100		71		29				32.9		4.4		
4		7.38		102		75		27				31.3		5.8		
5		7.35		104		73		31				31.3		6.3		
6		7.28		98		70		28				30.5		5.3		
7		7.27		102		70		32				30.5		6.3		
8		7.24		98		73		25				30.5		5.3		
9		7.35		98		72		26				31.3		4.9		
10		7.36		100		74		26				30.5		5.8		
11		7.37		104		73		31				30.5		6.8		
12		7.43		104		73		31				30.5		6.8		
13		7.40		102		75		27				32.9		4.9		
14		7.37		104		68		36				31.3		6.3		
15		7.33		100		75		25				30.5		5.8		
16		7.39		100		75		25				31.3		5.3		
17		7.43		100		71		29				30.5		5.8		
18		7.33		100		74		26				30.5		5.8		
19		7.40		106		72		34				28.9		8.3		
20		7.34		100		75		25				30.5		5.9		
21		7.45		100		71		29				30.5		5.9		
22		7.39		98		72		26				31.3		4.9		
23		7.54		98		75		23				32.1		4.4		
24		7.40		102		73		29				28.9		7.3		
25		7.39		98		71		27				29.7		5.8		
26		7.26		98		71		27				29.7		5.8		
27		7.26		98		73		25				29.7		5.8		
28		7.34		98		72		26				28.9		6.3		
29		7.36		98		75		23				28.9		6.3		
30		7.59		98		73		25				29.7		5.8		
31		7.50		98		71		27				30.5		5.3		
AVG		7.37		100		73		27				30.6		5.8		
MAX		7.59		106		75		36				32.9		8.3		
MIN		7.24		98		68		23				28.9		4.4		

**Bacteriological & Physical Parameters****WSSN 2310****May-12**

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Sta II	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		0/0	2/0	2/0	2/0					9.6				
2	1/0		0/0	2/0	0/0	2/0					11.9				
3	1/0		0/0	2/0	0/0	2/0					11.8				
4	1/0		2/0	2/0	2/0	2/0					12.0				
5	1/0		2/0	2/0	2/0	2/0					11.4				
6	1/0		2/0	2/0	2/0	2/0					11.2				
7	1/0		2/0	2/0	2/0	2/0					11.4				
8	1/0		2/0	2/0	2/0	2/0					12.6				
9	1/0		2/0	2/0	2/0	2/0					11.1				
10	1/0		2/0	2/0	2/0	2/0					11.0				
11	1/0		2/0	2/0	2/0	2/0					12.1				
12	1/0		2/0	2/0	2/0	2/0					11.7				
13	1/0		2/0	2/0	2/0	2/0					11.7				
14	1/0		2/0	2/0	2/0	2/0					12.4				
15	1/0		2/0	2/0	2/0	2/0					11.5				
16	1/0		2/0	2/0	2/0	2/0					11.3				
17	1/0		2/0	2/0	2/0	2/0			< 2		11.4				
18	1/0		2/0	2/0	2/0	2/0					12.7				
19	1/0		2/0	2/0	2/0	2/0					12.4				
20	1/0		2/0	2/0	2/0	2/0					13.1				
21	1/0		2/0	2/0	2/0	2/0					13.4				
22	1/0		2/0	2/0	2/0	2/0					13.5				
23	1/0		2/0	2/0	2/0	2/0					13.6				
24	1/0		2/0	2/0	2/0	2/0					14.3				
25	1/0		2/0	2/0	2/0	2/0					15.3				
26	1/0		2/0	2/0	2/0	2/0					14.8				
27	1/0		2/0	2/0	2/0	2/0					15.3				
28	1/0		2/0	2/0	2/0	2/0					15.3				
29	1/0		2/0	2/0	2/0	2/0					14.9				
30	1/0		2/0	2/0	2/0	2/0					14.8				
31	1/0		2/0	2/0	2/0	2/0					14.8				
											12.7				
											15.3				
											9.6				

May-12

[illegible]

May-12

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				144			
Total number of routine distribution samples required:				100			

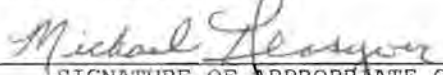
MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

DEQ
RESOURCE MANAGEMENT DIVISION

MAY 14 2012

For Month of April 2012

LANSING DISTRICT

Flint Water Plant
NAME OF WATER SYSTEM2310
WSSNGenesee
COUNTYMichael Glasgow
CERTIFIED OPERATORF-1R S-3
CLASSIFICATION

SIGNATURE OF APPROPRIATE OFFICIAL

ENTERED

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MP

Apr-12

[illegible]

**Flouridation & Chlorination****WSSN 2310****Apr-12**

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
		Raw	Tap	Dist		Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well			Tap	
								Free	Free	Free	Free			Free	
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.67					0.8	0.8	0.7	0.8			0.7	
2			0.66					0.8	0.7	0.7	0.7			0.8	
3			0.64					0.8	0.8	0.6	0.7			0.8	
4			0.68					0.8	0.7	0.6	0.7			0.7	
5			0.71					0.7	0.7	0.5	0.6			0.7	
6			0.68					0.7	0.7	0.6	0.7			0.8	
7			0.67					0.8	0.7	0.7	0.6			0.7	
8			0.65					0.6	0.7	0.5	0.6			0.7	
9			0.68					0.7	0.7	0.5	0.7			0.7	
10			0.68					0.8	0.7	0.5	0.6			0.8	
11			0.69					0.7	0.7	0.5	0.6			0.7	
12			0.66					0.7	0.6	0.5	0.6			0.6	
13			0.67					0.7	0.7	0.5	0.7			0.8	
14			0.70					0.7	0.8	0.5	0.7			0.8	
15			0.66					0.7	0.7	0.5	0.6			0.8	
16			0.69					0.7	0.7	0.5	0.7			0.8	
17			0.69					0.5	0.7	0.6	0.6			0.8	
18			0.66					0.8	0.6	0.5	0.6			0.6	
19			0.74					0.8	0.8	0.5	0.7			0.8	
20			0.71					0.8	0.7	0.5	0.7			0.8	
21			0.66					0.7	0.8	0.4	0.5			0.8	
22			0.59					0.8	0.7	0.5	0.5			0.8	
23			0.68					0.7	0.8	0.5	0.6			0.9	
24			0.66					0.9	0.8	0.5	0.5			0.7	
25			0.69					0.9	0.8	0.5	0.7			0.8	
26			0.66					0.9	0.9	n/a	1.0			1.0	
27			0.64					0.8	0.8	n/a	1.0			0.8	
28			0.67					0.8	n/a	n/a	0.9			1.0	
29			0.67					0.8	0.7	n/a	0.8			0.7	
30			0.66					0.8	0.9	n/a	1.0			0.8	
AVG			0.67					0.8	0.7	0.5	0.7			0.8	
MAX			0.74					0.9	0.9	0.7	1.0			1.0	
MIN			0.59					0.5	0.6	0.4	0.5			0.6	



Chemical Analyses

WSSN 2310

Apr-12

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.39		98		72		26				29.7		5.8		
2		7.33		98		70		28				30.5		5.3		
3		7.33		98		70		28				31.3		4.9		
4		7.33		100		70		30				30.5		5.8		
5		7.42		98		68		30				30.5		5.3		
6		7.33		98		72		26				29.7		5.8		
7		7.35		98		70		28				30.5		5.3		
8		7.26		100		72		28				28.9		6.8		
9		7.32		98		68		30				30.5		5.3		
10		7.35		98		72		26				30.5		5.3		
11		7.32		100		73		27				30.5		5.8		
12		7.33		98		70		28				30.5		5.3		
13		7.34		100		73		27				29.7		6.3		
14		7.38		98		74		24				30.5		5.3		
15		7.34		98		73		25				30.5		5.3		
16		7.39		98		75		23				29.7		5.8		
17		7.34		100		73		27				30.5		5.8		
18		7.45		98		72		26				29.7		5.8		
19		7.37		98		72		26				30.5		5.3		
20		7.36		100		71		29				29.7		6.3		
21		7.39		98		70		28				29.7		5.8		
22		7.28		98		73		25				30.5		5.3		
23		7.48		98		72		26				28.9		6.3		
24		7.41		98		74		24				30.5		5.3		
25		7.48		98		73		25				30.5		5.3		
26		7.35		100		71		29				29.7		6.3		
27		7.42		100		71		29				30.5		5.8		
28		7.28		102		71		31				29.7		6.8		
29		7.33		100		70		30				30.5		5.8		
30		7.43		100		65		35				30.5		5.8		
AVG		7.36		99		71		27				30.2		5.7		
MAX		7.48		102		75		35				31.3		6.8		
MIN		7.26		98		65		23				28.9		4.9		



Bacteriological & Physical Parameters

WSSN 2310

Apr-12

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap	Raw	Tap
	B&P		Dort	3MG Well	Sta. II	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					9.3				
2	1/0		2/0	2/0	2/0	2/0					10.3				
3	1/0		2/0	2/0	2/0	2/0					10.8				
4	1/0		2/0	2/0	2/0	2/0					12.2				
5	1/0		2/0	2/0	2/0	2/0			< 2		9.7				
6	1/0		2/0	2/0	2/0	2/0					10.4				
7	1/0		2/0	2/0	2/0	2/0					9.9				
8	1/0		2/0	2/0	2/0	2/0					9.9				
9	1/0		2/0	2/0	2/0	2/0					10.7				
10	1/0		2/0	2/0	2/0	2/0					9.9				
11	1/0		2/0	2/0	2/0	2/0					9.3				
12	1/0		2/0	2/0	2/0	2/0					10.1				
13	1/0		2/0	2/0	2/0	2/0					10.3				
14	1/0		2/0	2/0	2/0	2/0					10.5				
15	1/0		2/0	2/0	2/0	2/0					10.6				
16	1/0		2/0	2/0	2/0	2/0					10.3				
17	1/0		2/0	2/0	2/0	2/0					10.4				
18	1/0		2/0	2/0	2/0	2/0					10.6				
19	1/0		2/0	2/0	2/0	2/0					11.1				
20	1/0		2/0	2/0	2/0	2/0					11.2				
21	1/0		2/0	2/0	2/0	2/0					9.9				
22	1/0		2/0	2/0	2/0	2/0					8.9				
23	1/0		2/0	2/0	2/0	2/0					9.5				
24	1/0		2/0	2/0	2/0	2/0					9.3				
25	1/0		1/0	2/0	2/0	2/0					9.3				
26	1/0		0/0	2/0	2/0	2/0					10.5				
27	1/0		0/0	2/0	2/0	2/0					10.3				
28	1/0		0/0	2/0	0/0	2/0					10.5				
29	1/0		0/0	2/0	2/0	2/0					9.3				
30	1/0		0/0	2/0	2/0	2/0					9.3				
											10.1				
											12.2				
											8.9				

Apr-12

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				142			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of March 2012

 ENTERED

Flint Water Plant
NAME OF WATER SYSTEM

2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3

CLASSIFICATION

DEQ

RESOURCE MANAGEMENT DIVISION

Michael Glasgow
(SIGNATURE OF APPROPRIATE OFFICIAL)

APR 02 2012

LANSING DISTRICT

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al3+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MP

Mar-12

[illegible]



Flouridation & Chlorination

WSSN 2310

Mar-12

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well	Tap			
		Free	Free	Free				Free		Free					
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.61				0.8	0.9	0.8	0.8			0.9		
2			0.61				0.9	1.0	0.7	0.9			0.9		
3			0.63				0.9	0.8	0.8	0.8			0.8		
4			0.60				0.8	0.8	0.7	0.8			0.8		
5			0.62				0.9	0.7	0.7	0.8			0.8		
6			0.62				0.8	0.9	0.7	0.9			0.9		
7			0.60				0.8	0.9	0.8	0.7			0.8		
8			0.61				0.9	1.0	0.8	0.8			0.9		
9			0.65				0.9	0.9	0.6	0.8			0.8		
10			0.59				0.8	0.9	0.8	0.7			0.7		
11			0.64				0.8	0.9	0.8	0.8			0.9		
12			0.64				0.8	0.7	0.7	0.8			0.7		
13			0.63				0.9	0.8	0.7	0.8			0.9		
14			0.60				0.8	0.9	0.7	0.7			0.8		
15			0.63				0.8	0.8	0.7	0.9			0.8		
16			0.64				0.9	0.7	0.7	0.8			0.9		
17			0.64				0.8	0.8	0.7	0.8			0.8		
18			0.55				0.8	0.9	0.8	0.8			0.8		
19			0.59				0.8	0.9	0.8	0.8			0.8		
20			0.62				0.9	0.8	0.8	0.8			0.9		
21			0.65				0.8	0.9	0.8	0.8			0.8		
22			0.64				0.8	0.9	0.8	0.9			0.8		
23			0.70				0.8	0.9	0.8	0.9			0.9		
24			0.70				0.9	0.9	0.7	0.8			0.9		
25			n/a				0.8	0.7	0.8	0.7			0.7		
26			0.66				0.8	0.9	0.8	0.8			0.9		
27			0.71				0.7	1.0	0.7	0.8			0.9		
28			0.70				0.8	0.7	0.7	0.8			0.7		
29			0.64				0.8	0.8	0.8	0.8			0.8		
30			0.71				0.8	0.8	0.7	0.8			0.8		
31			0.65				0.9	0.7	0.7	0.7			0.7		
AVG			0.64				0.8	0.8	0.7	0.8			0.8		
MAX			0.71				0.9	1.0	0.8	0.9			0.9		
MIN			0.55				0.7	0.7	0.6	0.7			0.7		



Chemical Analyses

WSSN 2310

Mar-12

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.20		100		69		31				28.9		6.8		
2		7.34		96		69		27				28.1		6.3		
3		7.27		98		74		24				29.7		5.8		
4		7.26		98		71		27				29.7		5.8		
5		7.36		100		69		31				29.7		6.3		
6		7.30		96		68		28				28.1		6.3		
7		7.24		96		68		28				29.7		5.3		
8		7.29		98		66		32				28.1		6.8		
9		7.36		96		72		24				28.1		6.3		
10		7.29		98		70		28				29.7		5.8		
11		7.30		96		72		24				28.9		5.3		
12		7.34		96		72		24				28.1		6.3		
13		7.30		98		71		27				28.1		6.8		
14		7.32		98		71		27				29.7		5.8		
15		7.33		100		71		29				28.9		6.8		
16		7.30		98		72		26				29.7		5.8		
17		7.36		98		72		26				28.9		6.3		
18		7.28		98		72		26				29.7		5.8		
19		7.36		100		70		30				29.7		6.3		
20		7.34		98		71		27				28.9		6.3		
21		7.48		98		71		27				29.7		5.8		
22		7.44		100		71		29				28.1		7.3		
23		7.36		94		69		25				29.7		4.9		
24		7.39		96		74		22				28.9		5.8		
25		7.34		n/a		n/a		n/a				n/a		n/a		
26		7.39		96		71		25				28.1		6.3		
27		7.44		98		70		28				28.9		6.3		
28		7.37		96		70		26				28.9		5.8		
29		7.43		96		71		25				29.7		5.3		
30		7.32		96		71		25				29.7		5.3		
31		7.31		106		66		40				28.9		8.3		
AVG		7.34		98		70		27				29.0		6.1		
MAX		7.48		106		74		40				29.7		8.3		
MIN		7.20		94		66		22				28.1		4.9		

**Bacteriological & Physical Parameters****WSSN 2310****Mar-12**

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap		
	B&P		Dort	3MG Well	Pump	Lab Tap									
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	
1	1/0		2/0	2/0	2/0	2/0					11.5				
2	1/0		2/0	2/0	2/0	2/0					11.2				
3	1/0		2/0	2/0	2/0	2/0					9.7				
4	1/0		2/0	2/0	2/0	2/0					9.2				
5	1/0		2/0	2/0	2/0	2/0					9.9				
6	1/0		2/0	2/0	2/0	2/0					10.1				
7	1/0		2/0	2/0	2/0	2/0					9.0				
8	1/0		2/0	2/0	2/0	2/0			<2		10.3				
9	1/0		2/0	2/0	2/0	2/0					9.5				
10	1/0		2/0	2/0	2/0	2/0					7.7				
11	1/0		2/0	2/0	2/0	2/0					8.0				
12	1/0		2/0	2/0	2/0	2/0					8.4				
13	1/0		2/0	2/0	2/0	2/0					8.9				
14	1/0		2/0	2/0	2/0	2/0					7.7				
15	1/0		2/0	2/0	2/0	2/0					9.1				
16	1/0		2/0	2/0	2/0	2/0					9.5				
17	1/0		2/0	2/0	2/0	2/0					8.4				
18	1/0		2/0	2/0	2/0	2/0					8.8				
19	1/0		2/0	2/0	2/0	2/0					9.0				
20	1/0		2/0	2/0	2/0	2/0					10.6				
21	1/0		2/0	2/0	2/0	2/0					9.3				
22	1/0		2/0	2/0	2/0	2/0					9.7				
23	1/0		2/0	2/0	2/0	2/0					11.6				
24	1/0		2/0	2/0	2/0	2/0					11.4				
25	1/0		1/0	1/0	1/0	1/0					n/a				
26	1/0		2/0	2/0	2/0	2/0					10.9				
27	1/0		2/0	2/0	2/0	2/0					9.8				
28	1/0		2/0	2/0	2/0	2/0					10.3				
29	1/0		2/0	2/0	2/0	2/0					9.4				
30	1/0		2/0	2/0	2/0	2/0					9.8				
31	1/0		2/0	2/0	2/0	2/0					9.9				
											9.6				
											11.6				
											7.7				

[illegible]



Distribution System Monitoring

WSSN 2310

Mar-12

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				160			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT


ENTERED
For Month of February 2012
Flint Water Plant
NAME OF WATER SYSTEM

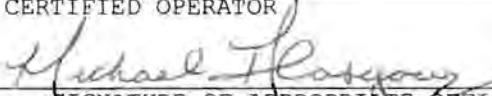
2310
WSSN

Genesee
COUNTY

Michael Glasgow
CERTIFIED OPERATOR

F-1R S-3
CLASSIFICATION

DEQ
RESOURCE MANAGEMENT DIVISION


SIGNATURE OF APPROPRIATE OFFICIAL

MAR 07 2012
LANSING DISTRICT
TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al3+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909



Feb-12

[illegible]



Flouridation & Chlorination

WSSN 2310

Feb-12

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCl-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well		Tap		
		Raw	Tap	Dist				Free	Free	Free	Free			Free	
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1			0.60					0.9	0.7	0.8	0.8			0.8	
2			0.64					0.9	0.7	0.7	0.8			0.9	
3			0.67					0.8	0.9	0.7	0.9			0.9	
4			0.66					0.8	0.9	0.8	0.8			0.9	
5			0.64					0.8	0.8	0.8	0.8			0.9	
6			0.62					0.8	0.8	0.8	0.8			0.8	
7			0.64					0.8	0.9	0.7	0.9			0.9	
8			0.62					0.9	1.0	0.8	0.8			0.7	
9			0.68					0.8	0.9	0.7	0.9			0.9	
10			0.61					0.9	0.9	0.8	0.9			0.8	
11			0.62					0.8	0.8	0.7	0.7			0.8	
12			0.61					0.9	0.9	0.7	0.8			0.8	
13			0.64					0.8	0.8	0.7	0.8			0.8	
14			0.58					0.8	0.8	0.8	0.8			0.9	
15			0.57					0.8	0.8	0.8	0.8			0.8	
16			0.61					0.9	0.8	0.8	0.9			0.9	
17			0.62					0.8	0.8	0.8	0.8			0.8	
18			0.61					0.8	0.7	0.8	0.8			0.7	
19			0.62					0.8	0.7	0.7	0.9			0.8	
20			0.62					0.8	0.8	0.7	0.8			0.7	
21			0.66					0.7	0.8	0.7	0.8			0.7	
22			0.66					0.9	0.8	0.7	0.8			0.9	
23			0.65					0.9	0.8	0.8	0.8			0.8	
24			0.67					0.9	0.8	0.7	0.8			0.8	
25			0.67					0.8	0.9	0.7	0.8			0.8	
26			0.63					0.9	0.8	0.8	0.8			0.7	
27			0.65					0.8	0.9	0.7	0.8			0.7	
28			0.65					0.9	0.8	0.8	0.8			0.9	
29			0.55					0.9	0.8	0.7	0.7			0.8	
AVG			0.63					0.8	0.8	0.7	0.8			0.8	
MAX			0.68					0.9	1.0	0.8	0.9			0.9	
MIN			0.55					0.7	0.7	0.7	0.7			0.7	



Chemical Analyses

WSSN 2310

Feb-12

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate 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	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.26		96		67		29				27.3		6.8		
2		7.29		98		71		27				28.1		6.8		
3		7.34		96		69		27				28.1		6.3		
4		7.32		96		66		30				27.3		7.3		
5		7.27		96		74		22				28.9		5.8		
6		7.34		96		67		29				29.7		5.3		
7		7.28		96		71		25				28.1		6.3		
8		7.39		98		71		27				29.7		5.8		
9		7.36		96		67		29				28.1		6.3		
10		7.39		98		70		28				29.7		5.8		
11		7.28		98		70		28				28.9		6.3		
12		7.28		98		70		28				29.7		5.8		
13		7.34		98		67		31				25.7		8.3		
14		7.33		98		72		26				29.7		5.8		
15		7.43		100		72		28				29.7		6.3		
16		7.20		92		69		23				28.1		5.3		
17		7.34		98		69		29				29.7		5.8		
18		7.18		98		66		32				28.9		6.3		
19		7.18		100		72		28				29.7		6.3		
20		7.28		98		68		30				29.7		5.8		
21		7.18		100		70		30				29.7		6.3		
22		7.32		90		65		25				28.1		4.9		
23		7.22		98		70		28				27.3		7.3		
24		7.26		98		70		28				27.3		7.3		
25		7.32		96		71		25				28.1		6.3		
26		7.40		98		72		26				29.7		5.8		
27		7.47		98		68		30				28.9		6.3		
28		7.30		98		70		28				28.1		6.8		
29		7.28		98		64		34				29.7		5.8		
AVG		7.30		97		69		28				28.7		6.3		
MAX		7.47		100		74		34				29.7		8.3		
MIN		7.18		90		64		22				25.7		4.9		



Bacteriological & Physical Parameters

WSSN 2310

Feb-12

D A T E	Total Coliform							Standard Plate Count		Wind Direction	Temp deg.C	Color		Odor	
	Plant Tap							Raw	Tap			Raw	Tap		
	B&P		Dort	3MG Well	Pump	Lab Tap									
														60	61
1	1/0		2/0	2/0	2/0	2/0					11.9				
2	1/0		2/0	2/0	2/0	2/0					11.9				
3	1/0		2/0	2/0	2/0	2/0					12.2				
4	1/0		2/0	2/0	2/0	2/0					11.7				
5	1/0		2/0	2/0	2/0	2/0					12.1				
6	1/0		2/0	2/0	2/0	2/0					11.6				
7	1/0		2/0	2/0	2/0	2/0					10.3				
8	1/0		2/0	2/0	2/0	2/0					8.4				
9	1/0		2/0	2/0	2/0	2/0					10.0				
10	1/0		2/0	2/0	2/0	2/0					9.4				
11	1/0		2/0	2/0	2/0	2/0					8.3				
12	1/0		2/0	2/0	2/0	2/0					8.5				
13	1/0		2/0	2/0	2/0	2/0					10.5				
14	1/0		2/0	2/0	2/0	2/0					9.7				
15	1/0		2/0	2/0	2/0	2/0					9.7				
16	1/0		2/0	2/0	2/0	2/0		< 2			11.3				
17	1/0		2/0	2/0	2/0	2/0					10.1				
18	1/0		2/0	2/0	2/0	2/0					8.8				
19	1/0		2/0	2/0	2/0	2/0					8.5				
20	1/0		2/0	2/0	2/0	2/0					8.6				
21	1/0		2/0	2/0	2/0	2/0					8.8				
22	1/0		2/0	2/0	2/0	2/0					11.2				
23	1/0		2/0	2/0	2/0	2/0					9.8				
24	1/0		2/0	2/0	2/0	2/0					8.8				
25	1/0		2/0	2/0	2/0	2/0					9.9				
26	1/0		2/0	2/0	2/0	2/0					9.7				
27	1/0		2/0	2/0	2/0	2/0					9.5				
28	1/0		2/0	2/0	2/0	2/0					10.2				
29	1/0		2/0	2/0	2/0	2/0					8.8				
											10.0				
											12.2				
											8.3				

Feb-12

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Feb-12

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				135			
Total number of routine distribution samples required:				100			

MONTHLY OPERATION REPORT OF WATER TREATMENT PLANT

For Month of January 2012

Flint Water Plant
NAME OF WATER SYSTEM

2310

Genesee

WSSN

COUNTY

Michael Glasgow
CERTIFIED OPERATOR

DEQ
RESOURCE MANAGEMENT DIVISION

F-1R S-3

CLASSIFICATION

FEB 13 2012

LANSING DISTRICT

Michael Glasgow
SIGNATURE OF APPROPRIATE OFFICIAL

TREATMENT RATE AND FILTER DATA

1. Treatment Rate, Maximum _____ Million Gallons Per Day
2. Treatment Rate, Approved Rated Plant Capacity _____ Million Gallons per Day
3. Average Filter Run _____ Hours, Average Head Loss _____ Feet
4. Average Filtration Rate _____ Gallons per Square Ft. per Minute
5. Maximum Filtration Rate _____ Gallons per Square Ft. per Minute
6. Average Wash Water Use _____ percent of Treated Water

CHEMICAL DATA

7. Chlorine on hand _____ lbs.: Estimated supply _____ days
8. Lime (CaO) on hand _____ lbs.: Estimated supply _____ days
9. Alum (Al₃+) on hand _____ lbs.: Estimated supply _____ days
10. Cost of All Chemicals per Million Gallons _____
11. Total Power Cost per Million Gallons _____

Remarks:

Submit to: Mike Prysby, P.E.
MDEQ-Water Division-Lansing District
P.O. Box 30242
Lansing, MI 48909

MS

Jan-12

[illegible]

**Flouridation & Chlorination****WSSN 2310****Jan-12**

D A T E	Fluoride Applied F- mg/l	Fluoride Analyses mg/l			Chlorine App. Mg/l			Chlorine Residual mg/l							
						Chlorine (prior to filtration) mg/L OCI-	Post Chlorine mg/L	B&P	Sta II	Dort	3MG Well	Tap			
		Free	Free	Free				Free			Free				
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1		0.56					0.8	0.8	0.7	0.7			0.6		
2		0.56					0.9	0.8	0.7	0.7			0.6		
3		0.59					0.9	0.9	0.8	0.7			0.9		
4		0.64					0.9	0.8	0.7	0.7			0.8		
5		0.63					0.7	0.8	0.7	0.7			0.7		
6		0.65					0.9	0.8	0.7	0.8			0.8		
7		0.65					0.8	0.8	0.7	0.7			0.7		
8		0.67					0.9	0.8	0.8	0.7			0.8		
9		0.69					0.8	0.8	0.7	0.8			0.8		
10		0.68					0.6	0.9	0.7	0.8			0.7		
11		0.70					0.8	0.7	0.7	0.7			0.8		
12		0.65					0.8	0.8	0.7	0.8			0.7		
13		0.68					0.8	0.8	0.7	0.8			0.7		
14		0.62					0.8	0.8	0.7	0.7			0.8		
15		0.61					0.7	0.8	0.7	0.8			0.7		
16		0.65					0.7	0.8	0.7	0.7			0.7		
17		0.66					0.9	0.8	0.7	0.8			0.8		
18		0.65					0.9	0.8	0.7	0.8			0.8		
19		0.67					0.9	0.9	0.7	0.8			0.9		
20		0.69					0.8	0.8	0.7	0.8			0.8		
21		0.62					0.7	0.8	0.7	0.7			0.7		
22		0.60					0.8	0.7	0.7	0.7			0.8		
23		0.64					0.7	0.8	0.7	0.8			0.7		
24		0.65					0.9	0.9	0.7	0.8			0.9		
25		0.62					0.9	0.8	0.7	0.8			0.9		
26		0.63					0.8	0.9	0.7	0.9			0.8		
27		0.62					0.9	0.9	0.8	0.9			0.8		
28		0.67					0.7	0.8	0.7	0.8			0.7		
29		0.66					0.7	0.8	0.7	0.7			0.8		
30		0.64					0.8	0.9	0.7	0.8			0.7		
31		0.64					0.8	0.9	0.6	0.8			0.7		
AVG		0.64					0.8	0.8	0.7	0.8			0.8		
MAX		0.70					0.9	0.9	0.8	0.9			0.9		
MIN		0.56					0.6	0.7	0.6	0.7			0.6		

**Chemical Analyses****WSSN 2310****Jan-12**

D A T E	pH		Total Hard as CaCO ₃ mg/l		Total Alk as CaCO ₃ mg/l		NonCarbonate Hardness as CaCO ₃ mg/l				Calcium Ca ++ mg/l		Magnesium as Mg ++ mg/l		Chloride as Cl - mg/l	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1		7.31		98		69		29				29.7		5.8		
2		7.36		98		71		27				29.7		5.8		
3		7.36		98		69		29				28.1		6.8		
4		7.31		102		68		34				28.9		7.3		
5		7.46		98		72		26				29.7		5.8		
6		7.31		94		69		25				27.3		6.3		
7		7.43		98		73		25				29.7		5.8		
8		7.34		94		71		23				27.3		6.3		
9		7.31		96		69		27				28.1		6.3		
10		7.26		96		71		25				28.1		6.3		
11		7.25		96		66		30				27.3		6.8		
12		7.36		96		72		24				29.7		5.3		
13		7.20		98		70		28				29.7		5.8		
14		7.24		98		67		31				29.7		5.8		
15		7.24		96		71		25				29.7		5.3		
16		7.26		98		69		29				29.7		5.8		
17		7.38		100		66		34				31.3		5.3		
18		7.35		96		70		26				27.3		6.8		
19		7.25		98		70		28				28.1		6.8		
20		7.22		96		70		26				27.3		6.8		
21		7.24		96		70		26				28.9		5.3		
22		7.21		96		69		27				29.7		5.3		
23		7.32		96		69		27				28.9		5.8		
24		7.23		98		68		30				28.9		6.3		
25		7.28		94		68		26				26.5		6.8		
26		7.24		96		71		25				27.3		6.8		
27		7.26		96		69		27				27.3		6.8		
28		7.21		96		71		25				28.1		6.3		
29		7.16		98		73		25				28.9		6.3		
30		7.31		98		67		31				29.7		5.8		
31		7.36		98		72		26				29.7		5.8		
AVG		7.29		97		70		27				28.7		6.1		
MAX		7.46		102		73		34				31.3		7.3		
MIN		7.16		94		66		23				26.5		5.3		

**Bacteriological & Physical Parameters****WSSN 2310****Jan-12**

D A T E	Total Coliform								Standard Plate Count		Wind Directio n	Temp deg.C	Color		Odor		
	Plant Tap																
	B&P		Dort	3MG Well	Pump	Lab Tap			Raw	Tap				Raw	Tap	Raw	Tap
	60	61	62	63	64	65	66		67	68			69	70	71	72	73
1	1/0		2/0	2/0	2/0	2/0					13.5						
2	1/0		2/0	2/0	2/0	2/0					12.2						
3	1/0		2/0	2/0	2/0	2/0					12.1						
4	1/0		2/0	2/0	2/0	2/0					15.2						
5	1/0		2/0	2/0	2/0	2/0					10.3						
6	1/0		2/0	2/0	2/0	2/0					14.2						
7	1/0		2/0	2/0	2/0	2/0					12.4						
8	1/0		2/0	2/0	2/0	2/0					12.7						
9	1/0		2/0	2/0	2/0	2/0					13.5						
10	1/0		2/0	2/0	2/0	2/0					12.9						
11	1/0		2/0	2/0	2/0	2/0					13.9						
12	1/0		2/0	2/0	2/0	2/0					11.3						
13	1/0		2/0	2/0	2/0	2/0					11.8						
14	1/0		2/0	2/0	2/0	2/0					11.7						
15	1/0		2/0	2/0	2/0	2/0					11.4						
16	1/0		2/0	2/0	2/0	2/0					9.9						
17	1/0		2/0	2/0	2/0	2/0			< 2		11.3						
18	1/0		2/0	2/0	2/0	2/0					13.5						
19	1/0		2/0	2/0	2/0	2/0					13.0						
20	1/0		2/0	2/0	2/0	2/0					11.8						
21	1/0		2/0	2/0	2/0	2/0					10.7						
22	1/0		2/0	2/0	2/0	2/0					10.6						
23	1/0		2/0	2/0	2/0	2/0					10.9						
24	1/0		2/0	2/0	2/0	2/0					13.1						
25	1/0		2/0	2/0	2/0	2/0					12.4						
26	1/0		2/0	2/0	2/0	2/0					12.8						
27	1/0		2/0	2/0	2/0	2/0					14.1						
28	1/0		2/0	2/0	2/0	2/0					11.0						
29	1/0		2/0	2/0	2/0	2/0					10.7						
30	1/0		2/0	2/0	2/0	2/0					10.3						
31	1/0		2/0	2/0	2/0	2/0					10.4						
											12.1						
											15.2						
											9.9						

Jan-12

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Distribution System Monitoring

WSSN 2310

Jan-12

[illegible]



ROUTINE POSITIVE DISTRIBUTION SAMPLES

Total number of positive routine samples:				Total Coliform: <u>0</u>		Fecal Coliform: <u>0</u>	
Date	Monitoring Station	Total Coliform	Fecal Coliform	Date	Retest of Station, Upstream & Downstream	Total Coliform	Fecal Coliform
Total number of routine distribution samples analyzed:				155			
Total number of routine distribution samples required:				100			

ANNOUNCEMENTS

ADoption - Adopting your new baby. A home visit is required. A letter of reference from a family member or friend is required. A letter of reference from a family member or friend is required. A letter of reference from a family member or friend is required.

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ADoption - Adopting your new baby. A home visit is required. A letter of reference from a family member or friend is required. A letter of reference from a family member or friend is required. A letter of reference from a family member or friend is required.

Public Notices

NOTICE TO CREDITORS - Notice to creditors of the estate of the late John Doe, deceased. The estate is being administered by the executor, Jane Doe. Creditors are required to file claims by a certain date.

NOTICE TO CREDITORS - Notice to creditors of the estate of the late John Doe, deceased. The estate is being administered by the executor, Jane Doe. Creditors are required to file claims by a certain date.

Blots

Blots - A collection of short stories or articles. The first story is about a man who finds a treasure map. The second story is about a woman who discovers a secret. The third story is about a man who finds a treasure map.

Public Notices

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Find more stories on mlive.com

Public Estate Auction - A public estate auction featuring a variety of items including furniture, electronics, and more. The auction is being held by a professional auctioneer.

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Business

Local service providers - A list of local service providers including plumbers, electricians, and more. These professionals are available to help with a variety of home and business needs.

Flint Journal

Place an ad in The Flint Journal - A service directory contact 810-767-0680. This service allows businesses to place advertisements in the Flint Journal, reaching a large audience.

WORKING WOMEN AND WOMEN

How to place your advertisement - A guide for women looking to place advertisements in the Flint Journal. The guide includes information on pricing, placement, and the benefits of advertising.

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Fall Happenings

Services & Events - A collection of services and events for the fall season. These include seasonal decorations, fall-themed parties, and more.

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Local mlive.com/sports

Local mlive.com/sports - A section of the mlive.com website dedicated to local sports news, scores, and updates. It covers a wide range of sports including football, basketball, and more.

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Real Estate

Real Estate - A section of the Flint Journal website dedicated to real estate listings. It includes information on homes for sale, rental properties, and more.

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