City of
Fitchburg

Department of
Public Works

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115 Mount Elam Road
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February 28, 2018

U.S. Environmental Protection Agency
Water Enforcement
OES4-SMR
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Re: CSOs Monitoring & Overflow Report
February 1, 2017 to January 31, 2018 Reporting Period
Consent Decree, VII. REMEDIAL MEASURES, Paragraphs 32 & 33

Dear Sir or Madam:

In accordance with Section VII, Paragraphs 32 and 33 of the Consent Decree (Decree) signed by Fitchburg's Mayor on June 1, 2012, this submission provides an Annual Summary of CSOs Monitoring, Overflows Reporting, and Inspection Certification of CSO Outfalls Report on the City's compliance with requirements of the Decree (as described by Paragraphs 32 and 33). In addition, weir wall adjustments at CSO locations and dry-weather CSO's will be discussed. The report covers the period from February 1, 2017 to January 31, 2018.

Monitoring Sites

The City of Fitchburg has maintained a total of 12 CSO Regulator Sites, all of which are metered. During the past year, the City closed CSO Regulator 036 on Laurel Street, leaving 11 CSO Regulators remaining in the City.

The Collections Team of the City's Wastewater Division continued to monitor meters throughout the city during the reporting period, and also monitored the City's 202 remaining combination manholes with tell-tale blocks for US EPA and Massachusetts Department of Environmental Protection (MADEP) reporting purposes. During the reporting period, the City monitored regulators with ADS Environmental, Inc. Triton+ (Triton) flow meters, the latest meter offered by ADS. The City has an on-call agreement with ADS to assist the City in troubleshooting problematic meters, installing meters in difficult sites, or for training purposes. In November 2017, the City installed a second RainAlert III rain gauge on roof at the Summer Street Fire Station, complementing the City's primary rain gauge at the DPW Building.

During the reporting period, the City had flow meters located at all of its remaining open overflow regulators. This report discusses the overflows recorded at each site, issues that occurred during the reporting period, and proposed future metering changes. The City experienced some data quality and meter downtime issues during the period, which prompted the City to have ADS visit all the sites in the City to conduct maintenance and repair.

As stated above, the City maintains two ADS RainAlert III rain gauges, one at DPW and one on the Summer Street Fire Station. The rain gauges logged a total of 44.28-inches of rainfall during the reporting period.

In order to most accurately calculate CSO volumes, a variety of methods were used. The City has worked closely with ADS to determine the most accurate way to calculate overflow volume, as CSO volume is notoriously difficult to obtain due to vastly different hydraulics at each CSO and differing rain events. The City is frequently reviewing data and methods to calculate overflow volume, and revising calculation methods as appropriate. Some of the City's CSO sites were calculated using a "silt-method". With this method, if the incoming pipe is large, and the crown of the pipe is above the weir wall elevation, a "silt-level" is set on the flow meter to match the weir wall elevation. Any flow that that is recorded over this elevation is a CSO. Other sites were calculated using a velocity vs. depth relationship. Plotting the data on a scattergraph, and using ADS' "Iso-Q" lines, the maximum amount of flow that passes through the regulator prior to an overflow can be interpolated. This flow rate is then subtracted from the total flow rate, revealing CSO volume.

At other sites, a more traditional method of using a weir wall equation or Manning's Equation in Excel were used. Manning's Equation for open channel flow was used when a depth of water was known at an overflow pipe. The broad-crested rectangular weir equation was utilized when known depths overtopped weir walls. When the capacity of the downstream pipe was exceeded, the overflow calculation methodology was changed to Manning's Equation for pressurized pipe.

Summary of Results

Table 1 includes the summary of overflows. The flow meters logged 159 overflow events totaling 12,283,719 gallons. Additional data shown in Table 1 includes notes regarding the operational status of the meter.

Table 2 contains annual rainfall data. Daily total, average intensity, peak hour intensity and duration of storm are provided.

Table 3 contains the meters' overflow detail. Overflow event dates, calculated gallons of overflow and duration of overflow are all provided. Daily rainfall is also provided for the reviewer's convenience.

Discussion of CSO Sites

CSO 004 - Cleghorn Street at Oak Hill Road

CSO 004 Highlights
5 Overflow Events
22,000 gal. Overflow
2 hr. Duration
80% Meter Coverage
System type: Combined

Five (5) overflow events were logged at CSO-004, totaling 22,000 gallons. The regulator manhole includes a 55" x 36" combined brick influent pipe, a 12" sanitary effluent pipe, and a 55" x 36" brick overflow pipe. A brick weir wall directs all flow to the 12" sanitary pipe. When this regulator does overflow, the 12" sanitary becomes inundated and a weir wall overtops. Overflows discharge to the Nashua River. Further sewer separation upstream is required to close this regulator. The meter experienced some data quality issues due to a periodically malfunctioning sensor. The sensor has since been replaced and the meter is operating as designed.

CSO 007 – Cushing Street at Riverfront Park

No overflow events were logged by the flow meter at Regulator CSO-007, however the meter malfunctioned during the largest rain event of year. This regulator manhole includes two influent pipes (a 16″ from Laurel Street and a 12″ from South Street), two 8″ effluent pipes to a 45″ interceptor, and an 18″ overflow core in the side of the chamber.

CSO 007 Highlights
0 Overflow Events
0 gal. Overflow
0 Hour Duration
95% Meter Coverage
System Type: Separate

There may be a possibility of closing this CSO in the next reporting period, due to the completion of the Hazel Street Sewer Separation Project in September 2017. The City will plan on monitoring the CSO-007 site until July 31, 2018. If no overflows occur at 007 following a large rain event, the City may decide to close the regulator.

CSO 010 – Main Street at River Street

Twenty-one (21) overflow events were logged by the flow meter at Regulator CSO-010 totaling 1,161,003 gallons. The regulator manhole consists of a 15″ influent pipe, 12″ effluent pipe and a 15″ overflow. A significant amount of combined sewer upstream overwhelms the 12″ effluent pipe during intense rainfall causing weir wall overtopping.

CSO 010 Highlights
21 Overflow Events
1,161,003 gal. Overflow
34.93 hr. Duration
90% Meter Coverage
System type: Combined

CSO 032 – 543 Main Street at Post Office

During the reporting period, CSO-032 experienced thirty-four (34) overflows at this site for a total of 1,192,696 gallons. The CSO regulator contains an 18″ combined influent pipe, an 8″ sanitary throttle discharge pipe, and an 18″ overflow to the drainage system. Due to a number of combined pipes upstream of this regulator, the 8″ throttle pipe becomes overwhelmed during heavy rainfall events and overflows to the drainage system.

CSO 032 Highlights
34 Overflow Events
1,192,696 gal Overflow
43.52 hr. min. Duration
100% Meter Coverage
System Type: Combined

CSO 036 – 98 Laurel Street

No overflow events were logged by the flow meter at CSO-036. This regulator was supposed to be closed in 2013, however soon after the overflow was plugged, a high-intensity rainstorm inundated the manhole and the result was an SSO. Subsequently it was learned there are additional catch basins tied into the upstream system and closing the regulator would be premature. Therefore, the contractor left a small opening to the drain system and the City installed a meter to document overflows.

CSO 036 Highlights
0 Overflow Events
0 gal. Overflow
0 hr. Duration
0% Meter Coverage
Closed May 25, 2017

The manhole includes a 39″ x 29″ combined brick interceptor influent with a 12″ VCP effluent. The contractor installed a 24″ DI drain pipe that skirts across the manhole and ties into the downstream 36″ drain pipe.

With the completion of the *Hazel Street Area Sewer Separation Project,* the regulator was able to be closed on May 25, 2017 with no known SSOs occurring at the site.

CSO 039 – Water Street at Walnut Street

Twenty-six (26) overflow events were observed at CSO-039, with an estimated overflow of 1,051,100 gallons. The meter was active for the majority of the reporting year, however the meter had data fallout during one of the largest rain events of the year. The regulator manhole consists of a 20″ influent, an 8″ effluent and an 18″ overflow.

CSO 039 Highlights
26 Overflow Events
1,051,100 gal. Overflow
28.58 hr. Duration
98% Meter Coverage
System Typed: Combined

MassDOT is planning to replace the bridge where this regulator is located in calendar year 2021, which will affect this regulator. Therefore, the City is targeting CSO-039 as the next combined sewer area to be separated. While the bridge is being replaced, the City plans on replacing and upsizing the sewer main that is suspended from the bridge deck, upsizing the sewer pipe downstream from this location, and building a new dog house manhole at the connection point of the sewer to the main trunk line on Water Street.

CSO 041 – Benson Road at Falulah Street

Three (3) overflow events were logged at CSO-041. This regulator manhole consists of a 12″ influent, a 10″ effluent, and an 18″ overflow. In past reporting periods, the City has experienced periodic overflows at this location. The contributing area to the regulator is fully separated, which correlates to high inflow in the contributing collection system. During the metering period, the data analysis by the City's engineering consultant revealed that high inflow is an issue in this portion of the City's sewer system. The contributing collection area is in the final stages of a formal Sewer System Evaluation Survey to determine the contributing sources of inflow. It is also likely that the base flow pipe is undersized, and will need to upsized in order close the overflow. The City experienced numerous issues with this meter during the reporting period related to connectivity, data logging and data quality issues. The flow sensor is also in the downstream pipe due to the difficult flow conditions at the site, which is likely leading to the data quality issues. The City is considering replacing the meter at this site with an ADS Echo ultrasonic level monitor. The Echo which will measure flow depth, and allow for calculation of overflows using a weir method.

CSO 041 Highlights
3 Overflow Events
6,000 gal. Overflow
0.17 Hr. Duration
70% Meter Coverage
System Type: Separated

CSO 045 – Main Street at Oliver/Putnam Street

During the reporting period, CSO-045 experienced 28 overflows at this site for a total of 2,820,000 gallons. This regulator consists of a chamber, with numerous inlets and outlets, and adjacent catch basins tied into the chamber. The basic construction of the chamber consists of a 30″ diameter drain on one edge of the chamber, a sewer line on the adjacent edge (12″ dia. inlet, 15″ dia. outlet), with a weir wall between the drain and sewer. In addition, there is a 26″ x 39″ inlet sewer that bridges the drain and discharges to the sewer side of the chamber. Overflows consist of flow topping the weir wall, and also a 26″ x 39″ overflow outlet line. With a large number of combined sewer areas upstream that contribute to this regulator, the City is in a waiting period in order to use the recently finished hydraulic model to determine a method for eventual closure.

CSO 045 Highlights
28 Overflow Events
2,820,000 gal. Overflow
101 Hr. Duration
73% Meter Coverage
System Type: Combined

CSO 048 – 85 Water Street at Market Basket

CSO 048 Highlights
1 Overflow Events
525 gal. Overflow
0.08 Hr. Duration
100% Meter Coverage
System Type: Separated

One (1) overflow event was logged at CSO-048. The manhole consists of an 18" influent pipe, an 8" throttle and an 18" overflow.

During the MassDOT bridge project adjacent to Regulator 039, the City also plans on constructing a small relief sewer at Regulator CSO-048 in order to close the regulator. There are no known areas of combined sewer that lead to this regulator. Few overflow events have occurred at this location during the four years the regulator has been monitored. The events that have occurred are of a relatively low volume, and a low height over the weir wall, therefore closing of the regulator would should add minimal additional flow to the main interceptor sewer.

CSO 064 – Water Street Easement Grit Chamber

CSO 064 Highlights
22 Overflow Events
3,903,694 gal. Overflow
24.58 Hr. Duration
98% Meter Coverage
System Type: Combined/Separated

During the reporting period, CSO-064 experienced 22 overflows at this site for a total of 3,903,694 gallons. This regulator is located within a former grit chamber on the trunk sewer. Upstream of the regulator, the sewer is 48" diameter and downstream it is 30" diameter, creating a bottleneck. The opening of the overflow is currently a partially plugged outlet pipe, which essentially creates a weir wall, with approximately a 15" diameter opening. In order to fully close this regulator, additional sewer separation work and inflow removal will be required upstream. Approximately 60% of the collection system is located upstream of this location.

During the next reporting period, the City will conducting hydraulic model runs which will simulate upsizing the trunk sewer downstream of the regulator, which will assist in determining a method for closure.

CSO 076 – Birch Street at Heywood Street

CSO 076 Highlights
8 Overflow Events
1,716,000 gal. Overflow
138.42 Hr. Duration
88% Meter Coverage
System Type: Separated

Eight (8) overflow events were logged at CSO-076 totaling 1,716,000 gallons. The regulator manhole consists of a 10" influent, 10" effluent, and a 12" overflow.

The contributing collection system area to CSO-076 contains areas of high infiltration, and sewers of poor construction, which leads to large quantity of suspected infiltration. In addition, the base flow pipe is undersized. It is anticipated that inflow and infiltration removal upstream will reduce the amount of overflows at this location. There is no known combined sewer upstream of this regulator. During April, there was an excessively long infiltration and rain event after snowmelt, leading to a long duration overflow.

CSO 083 – Main Street at Prichard Street

Eleven (11) overflow events were logged at CSO-083 totaling 410,701 gallons. The regulator manhole consists of a 12" x 18" brick combined sewer for an inlet, a 15" VC effluent pipe, and a 12" overflow.

CSO 083 Highlights
11 Overflow Events
410,701 gal. Overflow
3.92 Hr. Duration
80% Meter Coverage
System Type: Combined

About half of the upstream contribution area is combined sewer, constructed in the late 1800s to early 1900s. Minimal separation work would need to occur upstream of this location in order to close this regulator, however it is in a very densely develop area of the City.

Weir Wall Elevation Adjustments and Regulator Closures

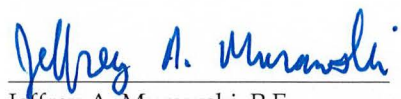
No weir wall adjustments were made during the reporting year, as we believe that we have maximized the existing capacity in the collection system based on surcharge heights within regulator manholes without causing customer back-ups.

Dry Weather Overflows

Dry weather overflows are associated with blockages that occur in the sanitary system and cause an overflow either over a weir wall or through a relief pipe in a combination manhole or a regulator manhole. The City experienced no dry-weather overflows during the reporting period, due to an increase in checking and servicing of problem regulators.

If you have any questions regarding this report, please contact the Fitchburg Sewer System Manager, Anthony W. Maressa, P.E., at 978-829-1916, or the undersigned.

Very Truly Yours,



Jeffrey A. Murawski, P.E.
Fitchburg DPW Deputy Commissioner of Wastewater

Electronic & Hard Copy:	Neil Handler, USEPA, Region 1 Office David Boyer, P.E., MassDEP, Central Region Office
Electronic copy: (Transmittal letter only)	Chief, Environmental Enforcement Section, DOJ Susan M. Poswistilo, Assistant U.S. Attorney Michael Wagner, USEPA Louis Dundin, Assistant Attorney General, Massachusetts AG Vincent Pusateri, II, Fitchburg City Solicitor
Electronic copy:	Lenny R. Laakso, P.E., Fitchburg Commissioner of Public Works Anthony Maressa, P.E., Sewer System Manager

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Jeffrey A. Murawski, P.E.
Fitchburg DPW Deputy Commissioner of Wastewater

Table 1: Summary of Overflows

CSO SUMMARY FEBRUARY 1, 2017 TO JANUARY 31, 2018

Meter	Location	Events	Volume (Gallons)	Notes
CSO-004	Cleghorn St at Oak Hill Road	5	22,000	80% coverage, intermittent issues with sensor near end of reporting period
CSO-007	Cushing St at Riverfront Park	0	0	95% coverage, will close next reporting period if no events
CSO-010	Main St. at River St.	21	1,161,003	90% coverage, intermittent sensor issues
CSO-032	543 Main St at Post Office	34	1,192,696	100% coverage
CSO-036	98 Laurel St.	0	0	Closed on 5/25/17
CSO-039	Water St at Walnut St.	26	1,051,100	98% coverage, missed large 10/24 rain event
CSO-041	Benson Rd. near Falulah St.	3	6,000	70% coverage, antenna and data logging/accuracy issues during year
CSO-045	Main St. at Oliver/Putnam St.	28	2,820,000	73% coverage on Meter 1, 100% on Meter 2
CSO-048	85 Water St at Market Basket	1	525	100% coverage
CSO-064	Water St. Easement at Chamber	22	3,903,694	98% coverage, data logging issues during large 10/24 and 10/29 events
CSO-076	Birch St. at Heywood Street	8	1,716,000	88% coverage. Two long-duration events due to high infiltration
CSO-083	Main St. at Prichard St.	11	410,701	80% coverage, intermittent data quality issues
	Totals	**159**	**12,283,719**	

Table 2: Rainfall

Date	Daily Total (inches)	Avg. Intensity (inches/hour)	Peak Hour (inches)	Duration (hours)
2/1/2017	0.08	0.02	0.08	0.04
2/8/2017	0.44	0.05	0.30	0.08
2/13/2017	0.18	0.05	0.18	0.04
2/14/2017	0.12	0.07	0.11	0.07
2/25/2017	0.24	0.16	0.21	0.06
3/1/2017	0.02	0.01	0.08	0.01
3/10/2017	0.10	0.04	0.03	0.11
3/15/2017	0.19	0.06	0.08	0.14
3/24/2017	0.07	0.04	0.05	0.08
3/25/2017	0.14	0.03	0.08	0.22
3/27/2017	0.66	0.08	0.22	0.33
3/28/2017	0.58	0.07	0.14	0.36
3/31/2017	0.18	0.01	0.04	0.56
4/1/2017	0.79	0.04	0.11	0.79
4/2/2017	0.67	0.06	0.27	0.45
4/4/2017	0.93	0.05	0.11	0.84
4/6/2017	1.07	1.00	0.22	0.58
4/12/2017	0.12	0.05	0.05	0.09
4/19/2017	0.08	0.03	0.04	0.11
4/21/2017	0.62	0.03	0.14	0.94
4/25/2017	0.53	0.04	0.12	0.60
4/26/2017	0.48	0.02	0.14	0.92
4/30/2017	0.03	0.01	0.02	0.13
5/2/2017	0.41	0.03	0.16	0.50
5/5/2017	1.07	0.07	0.28	0.67
5/6/2017	0.26	0.02	0.09	0.50
5/7/2017	0.13	0.03	0.10	0.19
5/13/2017	0.24	0.07	0.16	0.15
5/14/2017	0.99	0.15	0.25	0.28
5/15/2017	0.27	0.03	0.05	0.42
5/18/2017	0.28	0.22	0.26	0.05
5/19/2017	0.05	0.01	0.04	0.19
5/22/2017	0.31	0.01	0.09	0.90
5/25/2017	0.32	0.02	0.07	0.57
5/26/2017	1.74	0.11	0.55	0.68
5/31/2017	0.14	0.03	0.05	0.19
6/4/2017	0.09	0.02	0.04	0.18
6/5/2017	0.83	0.04	0.25	0.95
6/6/2017	1.14	0.05	0.14	24.00
6/7/2017	0.10	0.03	0.08	0.15
6/16/2017	0.30	0.04	0.14	0.33
6/17/2017	0.07	0.06	0.05	0.05
6/19/2017	0.36	0.11	0.18	0.14
6/20/2017	0.06	0.00	0.03	0.56
6/25/2017	0.40	0.23	0.00	0.07
6/26/2017	0.06	0.01	0.00	0.19
6/27/2017	0.14	0.09	0.12	0.06
6/30/2017	0.64	0.13	0.33	0.20
7/7/2017	0.5	0.10	0.21	0.21
7/8/2017	0.61	0.11	0.58	0.23
7/11/2017	0.3	0.05	0.24	0.24
7/13/2017	0.07	0.03	0.04	0.09

Table 2: Rainfall

Date	Daily Total (inches)	Avg. Intensity (inches/hour)	Peak Hour (inches)	Duration (hours)
7/14/2017	0.06	0.06	0.06	0.04
7/18/2017	0.17	0.17	0.17	0.02
7/24/2017	1.11	0.08	0.26	0.55
7/25/2017	0.09	0.05	0.08	0.08
7/27/2017	0.07	0.02	0.03	0.15
8/2/2017	1.42	0.41	1.26	0.15
8/4/2017	0.52	0.30	0.51	0.07
8/5/2017	0.80	0.07	0.42	0.46
8/12/2017	0.15	0.03	0.09	0.25
8/15/2017	0.05	0.02	0.03	0.11
8/18/2017	0.31	0.03	0.19	0.42
8/23/2017	0.95	0.76	0.91	0.05
9/3/2017	0.93	0.07	0.34	0.58
9/6/2017	2.18	0.13	0.47	0.69
9/7/2017	0.66	0.03	0.25	0.83
9/14/2017	0.07	0.03	0.03	0.09
9/15/2017	0.05	0.02	0.02	0.13
9/30/2017	0.11	0.01	0.03	0.32
10/8/2017	0.30	0.08	0.16	0.16
10/9/2017	0.70	0.05	0.33	0.58
10/24/2017	1.21	0.06	0.23	0.81
10/25/2017	1.06	0.04	0.38	24.00
10/26/2017	2.16	0.12	0.46	0.77
10/29/2017	1.58	0.11	0.44	0.61
10/30/2017	2.45	0.31	0.87	0.33
11/6/2017	0.10	0.03	0.08	0.15
11/7/2017	0.03	0.01	0.01	0.14
11/13/2017	0.07	0.01	0.02	0.34
11/14/2017	0.05	0.01	0.02	0.17
11/16/2017	0.37	0.03	0.17	0.48
11/18/2017	0.09	0.02	0.04	0.19
11/19/2017	0.31	0.03	0.09	0.41
11/22/2017	0.32	0.04	0.16	0.32
12/1/2017	0.06	0.03	0.03	0.09
12/5/2017	0.47	0.04	0.20	0.46
12/6/2017		0.04	0.11	0.18
12/10/2017	0.39	0.13	0.18	0.13
12/12/2017	0.30	0.03	0.10	0.36
12/23/2017	0.52	0.04	0.16	0.49
12/24/2017	0.33	0.02	0.05	0.61
12/25/2017	0.11	0.07	0.10	0.06
1/3/2018	0.04	0.03	0.03	0.05
1/12/2018	0.84	0.09	0.19	0.39
1/13/2018	0.24	0.03	0.11	0.38
1/17/2018	0.21	0.04	0.07	0.21
1/18/2018	0.07	0.04	0.05	0.08
Total	44.28			

TABLE 3: METER OVERFLOW DATA SUMMARY

CSO SUMMARY

CSO-004 - Cleghorn St. at Oak Hill Rd.

Rainfall (in.)	Events (No.)	Volume (Gallons)	Duration (Hours)	Date
1.74	1	1,000	0.25	5/26/17
0.61	1	1,000	0.25	7/8/17
0.52	1	1,000	0.25	8/4/17
0.95	1	3,000	0.25	8/23/17
2.45	1	16,000	1	10/30/17
Totals	5	22,000	2	

CSO-007 - Cushing Street at Riverfront Park

Rainfall (in.)	Events (No.)	Volume (Gallons)	Duration (Hours)	Date
Totals	NO OVERFLOW EVENTS RECORDED			

CSO-010 - Main Street at River Street

Rainfall (in.)	Events (No.)	Volume (Gallons)	Duration (Hours)	Date
1.07	1	13,000	1.75	04/06/17
0.28	1	7,000	0.25	05/18/17
1.74	1	70,000	1.75	05/26/17
0.83	1	27,000	1	06/05/17
0.4	1	1,000	0.25	06/25/17
0.64	1	20,000	0.75	06/30/17
0.61	1	102,003	0.33	07/08/17
0.17	1	8,000	0.37	07/18/17
1.11	1	7,000	0.23	07/24/17
1.42	1	24,000	0.25	08/02/17
1.32	1	111,000	1.75	8/04/17 & 8/05/17
0.31	1	2,000	0.25	08/18/17
0.95	1	63,000	1	08/22/17
0.93	1	27,000	1.5	09/03/17
2.84	1	155,000	6	9/6/17 & 9/7/17
0.3	1	6,000	0.25	10/08/17
0.7	1	28,000	0.5	10/09/17
2.27	1	53,000	1.5	10/24/17 & 10/25/17
2.16	1	78,000	3	10/26/17
4.03	1	323,000	10.75	10/29/17 & 10/30/17
0.84	1	36,000	1.5	01/12/18
Totals	21	1,161,003	34.93	

CSO-032 - Main St. at Post Office (542 Main St.)

Rainfall (in.)	Events (No.)	Volume (Gallons)	Duration (Hours)	Date
0.24	1	300	0.03	02/25/17
0.66	1	100	0.02	03/27/17
0.93	1	20,000	3.25	04/04/17
1.07	1	7,000	1	04/06/17
0.12	1	2,011	0.25	04/12/17
0.62	1	70	0.08	04/21/17
0.48	1	2,417	0.20	04/26/17
0.41	1	13,545	0.17	05/02/17
1.07	1	36,135	1.17	05/05/17
0.99	1	26,034	1.00	05/14/17
0.28	1	14,011	0.15	05/18/17
1.74	1	115,870	1.22	05/26/17
0.83	1	54,014	0.67	06/05/17
0.4	1	19,515	0.45	06/25/17
0.64	1	56,674	0.53	06/30/17
0.61	1	33,000	0.50	07/08/17
0.3	1	11,000	0.50	07/11/17
0.17	1	4,000	0.08	07/18/17
1.11	1	18,000	0.50	07/24/17
1.42	1	171,000	1.25	08/02/17
0.52	1	64,000	0.75	08/04/17
0.8	1	24,000	1.00	08/05/17
0.31	1	4,000	0.50	08/18/17
0.95	1	57,000	1.00	08/23/17
0.93	1	17,000	1.00	09/03/17
2.18	1	115,000	7.25	9/6/17 & 9/7/17
0.3	1	3,000	0.50	10/08/17
0.7	1	7,000	0.50	10/09/17
2.27	1	37,000	3.50	10/24/17 & 10/25/17
2.16	1	36,000	5.50	10/26/17
4.03	1	219,000	8.00	10/29/17 & 10/30/17
0.37	1	1,000	0.25	11/16/17
0.47	1	1,000	0.25	12/05/17
0.84	1	3,000	0.50	01/12/18
Totals	34	1,192,696	43.52	

CSO-036 - 98 Laurel Street

Rainfall (in.)	Events (No.)	Volume (Gallons)	Duration (Hours)	Date
	CLOSED 5/25/17			
Totals	NO OVERFLOW EVENTS RECORDED			

TABLE 3: METER OVERFLOW DATA SUMMARY

CSO-039 - Water St at Walnut St

Rainfall (in.)	Events (No.)	Volume (Gallons)	Duration (Hours)	Date
0.66	1	23,000	0.5	03/27/17
1.07	1	15,000	0.17	04/06/17
0.48	1	22,000	0.42	04/26/17
0.41	1	34,000	0.42	05/02/17
1.07	1	89,000	2.08	05/05/17
0.99	1	19,000	2.50	05/14/17
0.28	1	5,000	0.33	05/18/17
1.74	1	51,000	0.50	05/26/17
0.83	1	15,000	0.58	06/05/17
0.4	1	11,000	0.25	06/25/17
0.14	1	12,000	0.17	06/27/17
0.64	1	100	0.08	06/30/17
0.61	1	37,000	0.58	07/08/17
0.3	1	11,000	0.33	07/11/17
0.17	1	15,000	0.33	07/18/17
1.11	1	13,000	0.33	07/24/17
1.42	1	28,000	0.75	08/02/17
0.52	1	48,000	0.50	08/04/17
0.8	1	18,000	0.50	08/05/17
0.31	1	18,000	0.50	08/18/17
0.95	1	153,000	1.00	08/22/17
0.93	1	21,000	0.50	09/03/17
2.84	1	164,000	3.75	9/6/17 & 9/7/17
0.3	1	14,000	0.50	10/08/17
0.7	1	45,000	0.50	10/09/17
1.08	1	170,000	10.50	1/12/18 & 1/13/18
Totals	26	1,051,100	28.58	

CSO-041 - Benson Road near Falullah St

Rainfall (in.)	Events (No.)	Volume (Gallons)	Duration (Hours)	Date
0.61	1	6,000	0.17	07/08/17
0.66	1	Unknown	Unknown	09/07/17
2.45	1	Unknown	Unknown	10/30/17
Totals	3	6,000	0.17	

TABLE 3: METER OVERFLOW DATA SUMMARY

CSO-045 - Main St. at Oliver/Putnam St.

Rainfall (in.)	Events (No.)	Volume (Gallons)	Duration (Hours)	Date
0.24	1	1,000	0.5	02/25/17
0.66	1	1,000	0.5	03/27/17
0.93	1	216,000	17.25	04/04/17
1.07	1	447,000	12.25	04/06/17
0.48	1	35,000	0.75	04/26/17
0.41	1	29,000	1	05/02/17
1.07	1	142,000	2.25	05/05/17
0.24	1	9,000	0.5	05/13/17
0.99	1	114,000	3.25	05/14/17
0.28	1	31,000	20	05/18/17
1.74	1	257,000	6	05/26/17
0.83	1	127,000	1.5	06/05/17
0.64	1	18,000	0.5	06/30/17
0.61	1	38,000	0.5	07/08/17
0.3	1	7,000	0.75	07/11/17
1.42	1	102,000	1.25	08/02/17
0.8	1	11,000	1.25	08/05/17
0.95	1	30,000	0.75	08/23/17
0.93	1	43,000	0.75	09/03/17
2.18	1	163,000	4.25	09/06/17
0.3	1	16,000	0.5	10/08/17
1.21	1	77,000	4	10/24/17
2.16	1	278,000	4.5	10/26/17
1.58	1	139,000	2.75	10/29/17
0.37	1	29,000	2.75	11/16/17
0.32	1	6,000	0.5	11/22/17
0.19	1	71,000	1	12/06/18
0.84	1	383,000	9.25	01/12/18
Totals	28	2,820,000	101	

CSO-048 - 85 Water St at Market Basket

Rainfall (in.)	Events (No.)	Volume (Gallons)	Duration (Hours)	Date
	1	525	0.08	10/30/17
Totals	1	525	0.08	

CSO-064 - Water Street Easement at Chamber

Rainfall (in.)	Events (No.)	Volume (Gallons)	Duration (Hours)	Date
0.24	1	33,407	0.33	02/25/17
0.93	1	341,810	3.17	04/04/17
1.07	1	967,348	5.92	04/06/17
1.07	1	238,634	1.33	05/05/17
0.99	1	40,461	0.42	05/14/17
0.28	1	28,478	0.33	05/18/17
1.74	1	449,140	2.17	05/26/17
0.83	1	120,900	0.92	06/05/17
0.4	1	71,046	0.50	06/25/17
0.61	1	121,746	0.58	07/08/17
0.3	1	18,041	0.25	07/11/17
1.11	1	21,102	0.25	07/24/17
1.42	1	187,951	0.83	08/02/17
0.52	1	113,257	0.50	08/04/17
0.8	1	105,014	0.75	08/05/17
0.95	1	199,780	0.83	08/23/17
0.93	1	39,471	0.33	09/03/17
2.18	1	361,225	2.25	09/06/17
0.7	1	38,491	0.33	10/09/17
1.06	1	86,897	0.50	10/25/17
0.19	1	13,731	0.25	12/06/17
0.84	1	305,763	1.83	01/12/18
Totals	22	3,903,694	24.58	

CSO-076 - Birch St at Heywood St

Rainfall (in.)	Events (No.)	Volume (Gallons)	Duration (Hours)	Date
0.24	1	6,000	1	2/25/17
2	1	1,263,000	126.42	4/3/17 to 4/8/17
0.61	1	8,000	0.50	7/8/17
0.95	1	4,000	0.25	8/23/17
0.7	1	2,000	0.25	10/9/17
1.06	1	2,000	0.25	10/25/17
1.58	1	2,000	0.25	10/29/17
2.45	1	429,000	9.50	10/30/17
Totals	8	1,716,000	138.42	

CSO-083 - Main St. at Prichard St.

Rainfall (in.)	Events (No.)	Volume (Gallons)	Duration (Hours)	Date
0.93	1	11,300	0.08	4/6/17
1.07	1	21,170	0.25	5/5/17
0.28	1	12,500	0.08	5/18/17
1.74	1	108,050	0.83	5/26/17
0.83	1	52,805	0.42	6/5/17
0.64	1	24,666	0.25	6/30/17
0.61	1	25,080	0.25	7/8/17
1.11	1	475	0.08	7/24/17
1.42	1	92,785	0.83	8/2/17
0.52	1	44,665	0.33	8/4/17
0.8	1	17,205	0.50	8/5/17
	11	410,701	3.92	