City of Richmond, Virginia
Department of Public Utilities
Integrated CSS and MS4
2021 Annual Report

March 30, 2022

Legend for Cover Photos:

1. Forest View Green Alley event – June 2021, Mayor Levar Stoney and April Bingham, Director, DPU
2. Sewer Monster from Shockoe 96-Inch Interceptor – 10/19/21
3. Keep Virginia Cozy Earth Day Clean-Up Event at Belle Isle – 4/25/21
4. Richmond DPU accepts "2021 National Environmental Achievement Award from the National Association of Clean Water Agencies, Public Information and Education E-Media" – 4/29/20, Jennifer Clarke, Public Information and Outreach Coordinator and Patrick Bradley, Deputy Director, DPU

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List of Abbreviations

CSS	combined sewer system
DPU	Department of Public Utilities
DWF	dry weather flow
DWO	dry weather overflow
I/I	inflow and infiltration
MG	million gallons
MGD	million gallons per day
MS4	Municipal Separate Storm Sewer System
NMC	nine minimum controls
SCM	six minimum controls
WWTP	Richmond Wastewater Treatment Plant

Section 1

General Information

Permittee Name

City of Richmond

System Name

City of Richmond, Department of Public Utilities (DPU)

Richmond Wastewater Treatment Plant (WWTP), Richmond Combined Sewer System (CSS) and Richmond Municipal Separate Storm Sewer System (MS4)

VPDES Permit No.

VA0063177

Reporting Period

January 1, 2021 through December 31, 2021

Certification Statement

"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."

_____

April Bingham, Director of Public Utilities Date

Section 2

Combined Sewer System (CSS)

The metered results of the volume and number of overflows for each combined sewer overflow (CSO) outfall based on the measured storm event data for the 2021 reporting period is presented in Tables 2-1 and 2-2 below, respectively. A map of the CSS outfalls is presented in Appendix A.

Table 2-1. Modeled Overflow Volume (MG)

CSO Outfall	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Total FY21
Hampton Street CSO Area													
19	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0
McCloy Street CSO Area													
20	0	0	0	0	0	0.11	0	0.14	0	0	0	0	0.3
Northside James River Park CSO Area													
7	0	0	0.01	0.01	0.07	1.12	0	0	0	0	0	0	1.2
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.28	0.42	0.45	0.15	0.67	4.69	2.84	9.07	12.54	0.01	0	0	31.1
Southside James River Park CSO Area													
15	0.53	0	0.01	0	0.01	1.62	0	0	0	0	0	0	2.2
16	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	1.46	0	2.76	0.15	0	0	0	4.4
18	0	0	0	0	0	0	0	0	0	0	0	0	0
40	3.31	7.64	4.69	0.32	4.18	16.84	5.25	15.94	1.99	0	0	0.2	60.4
Shockoe Creek CSO Area													
6	106.28	497.02	17.42	0	98.17	206.05	173.41	437.85	125.68	58.70	0.01	0.07	1720.7
34	1.91	1.15	10.55	7.47	2.03	9.04	7.91	6.64	9.53	1.62	0.05	0.37	58.2
Wastewater Treatment Plant CSO Area													
14	0.24	0.71	0.03	0	0.11	9.80	0.95	1.11	1.96	0.02	0	0	14.9
21	20.03	34.26	6.76	2.69	7.46	14.11	8.62	18.57	5.88	0.25	0.02	2	120.7
Gillies Creek CSO Area													
4	0.19	0.84	0.66	0.19	0.99	5.22	1.96	3.62	0	0	0	0.01	13.7
5	0	0.29	0.17	0	0.07	1.83	0.54	1.62	0.41	0.08	0	0	5.0
24	0	0.01	0	0	0	1.09	0.24	0.15	0.26	0	0	0	1.8
25	0	0	0	0	0	0.30	0	0.07	0	0	0	0	0.4
26	0.42	0.04	0	0	0	2.46	0.31	0.69	0.28	0.01	0	0	4.2
31	0	0.50	0	0.25	0.42	7.07	1.45	7.04	3.62	0	0	0	20.4
35	0.19	0.27	0.24	0.08	0.22	0.92	0.57	0.20	0	0	0	0.03	2.7
39	0.30	2.03	0.75	0.11	0.73	7.06	1.59	8.11	3.77	1.15	0.03	0.03	25.7
Hilton Street CSO Area													
12	0.02	0.06	0.03	0	0	1.25	0.12	0.29	0.32	0.05	0	0	2.1

Table 2-2. Modeled Number of Overflow Occurrences													
CSO Outfall	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Total FY21
Hampton Street CSO Area													
19	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0
McCloy Street CSO Area													
20	0	0	0	0	0	1	0	1	0	0	0	0	2
Northside James River Park CSO Area													
7	0	0	1	0	2	4	0	0	0	0	0	0	7
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0
11	3	1	4	2	4	5	4	10	2	0	0	0	35
Southside James River Park CSO Area													
15	2	0	1	0	0	2	0	0	0	0	0	0	5
16	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	2	0	1	1	0	0	0	4
18	0	0	0	0	0	0	0	0	0	0	0	0	0
40	5	9	4	5	3	5	6	8	3	0	0	3	51
Shockoe Creek CSO Area													
6	5	13	3	0	5	9	7	10	5	6	1	1	65
34	1	1	2	1	5	3	2	10	1	5	2	4	37
Wastewater Treatment Plant CSO Area													
14	1	2	1	0	3	5	3	6	3	1	0	0	25
21	6	7	4	10	12	8	4	4	6	8	1	5	75
Gillies Creek CSO Area													
4	3	6	4	3	3	5	5	9	0	0	0	0	38
5	0	3	2	0	1	3	3	3	1	1	0	0	17
24	0	0	0	0	0	2	2	2	1	0	0	0	7
25	0	0	0	0	0	2	0	1	0	0	0	0	3
26	2	1	0	0	0	3	2	2	1	0	0	0	11
31	0	1	0	1	1	4	2	5	1	0	0	0	15
35	3	6	4	3	4	5	6	3	0	0	0	1	35
39	2	6	3	3	4	4	3	7	4	3	0	1	40
Hilton Street CSO Area													
12	1	1	1	0	0	4	2	2	3	1	0	0	15

Section 3

CSS and MS4 Nine Minimum Controls (NMC) and Six Minimum Controls (MCM)

3.1 Operation and Maintenance of the CSS (NMC 1)

3.1.1 Inspection and Maintenance of CSS Control Structures and Pump Stations

The City follows a regular schedule for inspection and maintenance of regulators, CSO outfalls, and pump stations. The schedule of performance of the City's O&M program is summarized in Table 3-1 and 3-2 below. Equipment inspection, screen cleaning and debris removal are part of the regular activities.

Table 3-1. CSS Control Structure O&M Program

CSO Control Structures	Inspection Interval	Maintenance	
		Interval	Type
Dry Weather Regulators (29) Wet Weather Regulators (10)	Monthly	Monthly	Preventative Maintenance
CSO Outfalls (25)	Monthly	Monthly	Preventative Maintenance

Table 3-2. CSS Pump Station O&M Program

Pump Station	Capacity (MGD)		Estimated Dry Weather Peak (MGD)	Inspection/ Maintenance Interval
	Firm	Installed		
Douglasdale	7.5	13.0	2.2	Daily
Hampton/McCloy	0.9	1.7	0.4	Daily
Upham Brook	8.6	13.0	0.3	Daily

If major repairs are deemed necessary at the inspection, a work order is initiated, and the repairs are scheduled. Major repairs may be handled by the City's maintenance department or by outside contractors.

3.1.2 Sewer Flushing and Cleaning

The City follows a regular schedule for routine sewer line flushing and cleaning. Maintenance activities performed on the collection system during the 2021 reporting period are summarized in Table 3-3 below.

Table 3-3. Sewer System Maintenance Activities		
Activity	Interval	Quantity
Sewer Cleaning	Annually	33.1 miles
CCTV Inspection	Annually	33.8 miles

3.1.3 Catch Basin Cleaning

The City follows a regular schedule for routine catch basin cleaning. The City cleaned 4,502 catch basins throughout the CSS during the 2021 reporting period.

3.2 Use of Collection System for Storage (NMC 2)

3.2.1 Information regarding storage at Shockoe Retention Basin and Hampton/McCloy Tunnel

Storage is provided in the Shockoe and Hampton/McCloy CSO areas through existing retention facilities.

- The Shockoe facilities serve about 8,000 acres of the CSS and comprise a 35 million gallon (MG) retention basin with upstream in-line storage of approximately 15 MG in diversion structures and arch and box sewers.
- The Hampton/McCloy tunnel serves about 1,012 acres of the CSS and comprises a 7.2 MG retention tunnel.

3.2.2 Sewer Re-lining Activities to reduce Inflow and Infiltration (I/I)

The City implements a sewer lining program annually to reduce I/I. The City lined 16,430 feet of sewer during the 2021 reporting period.

3.2.3 Operation of WWTP influent pumping to fill intercepting system

During wet weather events the Main Pumping Station is operated at 140 MGD to maximize flow to the WWTP. As the wet weather event continues, combined sewage is stored in the interceptor system before overflows occur. Portions of the intercepting sewers that convey flow to the WWTP are located at elevations below the lowest CSO outfall overflow elevation. The majority of these low-lying intercepting sewers are in the Shockoe CSO drainage area where the lowest overflow elevation is 1.00 feet. Table 3-4 below summarizes the intercepting sewers below the lowest CSO overflow elevation and the corresponding estimated storage capacity.

Table 3-4. Intercepting Sewers Below Lowest CSO Overflow Elevation			
Intercepting Sewer	Diameter (inches)	Length Below (El + 1.00 (feet)	Storage Capacity (MG)
Lower Goodes Creek	72	10,905	2.61
Twin River Crossings	66	1,100	0.39
Hull Street	60	2,700	0.40
Shockoe	96	2,700	1.02
Gillies Creek	60	2,500	0.37

Table 3-4. Intercepting Sewers Below Lowest CSO Overflow Elevation			
Intercepting Sewer	Diameter (inches)	Length Below (El + 1.00 (feet)	Storage Capacity (MG)
Northside CSO Conveyance (1)	96, 84, 60	2,850	0.89
		Total	5.68
(1) Northside CSO Conveyance stores CSS to an elevation of 16.0 feet			

3.2.4 Tide Gate Inspections

The City routinely inspects and makes necessary repairs to tide gates to reduce tidal intrusion into the collection system. The City follows a regular schedule for inspection and maintenance of tide gates. The schedule of performance of the City's O&M program is summarized in Table 3-5 below. Equipment inspection, and debris removal are part of the regular activities.

Table 3-5. Tide Gate O&M Program			
Gates	Inspection Interval	Maintenance	
		Interval	Type
CSO 04 (Bloody Run) Tide Gate	Monthly	Monthly	Preventative/Corrective Maintenance
CSO 05 (Peach Street) Tide Gate	Monthly	Monthly	Preventative/Corrective Maintenance
CSO 06 (Shockoe) Tide Gates (6)	Monthly	Monthly	Preventative Maintenance
CSO 14 (Stockton Street) Tide Gate	Monthly	Monthly	Preventative Maintenance
CSO 15 (Canoe Run) Tide Gate	Monthly	Monthly	Preventative Maintenance
CSO 16 (Woodland Heights) Tide Gate	Monthly	Monthly	Preventative Maintenance
CSO 17 (Reedy Creek) Tide Gate	Monthly	Monthly	Preventative Maintenance
CSO 18 (42nd Street) Tide Gate	Monthly	Monthly	Preventative Maintenance
CSO 19 (Hampton) Flap Gate (2)	Monthly	Monthly	Preventative Maintenance
CSO 20 (McCloy) Flap Gate (3)	Monthly	Monthly	Preventative Maintenance
CSO 21 (Gordon Avenue) Tide Gate	Monthly	Monthly	Preventative/Corrective Maintenance

3.2.5 Use of Public and Private Stormwater Facilities in the CSS Area

Local retention facilities provide additional stormwater storage in the CSS area. Examples of these types of facilities are shown in Table 3-6 below.

Table 3-6. Local Stormwater Retention Facilities in the CSS Area		
Site	Location	Owner
Brander St. Pump Station Holding Pond	Brander St.	City
Gordon Ave. Pump Station Holding Pond	Gordon Ave.	City
DPU Operations Parking Lot	Commerce Rd.	City
Sonoco Products Company	Commerce Rd.	Private (1)
BP Products North America	Commerce Rd.	Private (1)

Table 3-6. Local Stormwater Retention Facilities in the CSS Area		
Site	Location	Owner
Citgo Petroleum Corporation	Maury St.	Private (1)
First Energy Corporation	Maury St.	Private (1)
Magellan Terminals Holdings, L.P. Richmond Terminal	East First St.	Private (1)
Transmontaigne Terminaling	Commerce Rd.	Private (1)
(1) Industry that retains stormwater on-site during wet weather events and control releases to permit limits at the WWTP		

3.2.6 Use of Real Time Decision Support System to manage flows during CSO Events

DPU utilizes 50 depth sensors, 23 flow meters, and 10 rain gauges (shown below in Figure 3-1) to monitor the collection system.

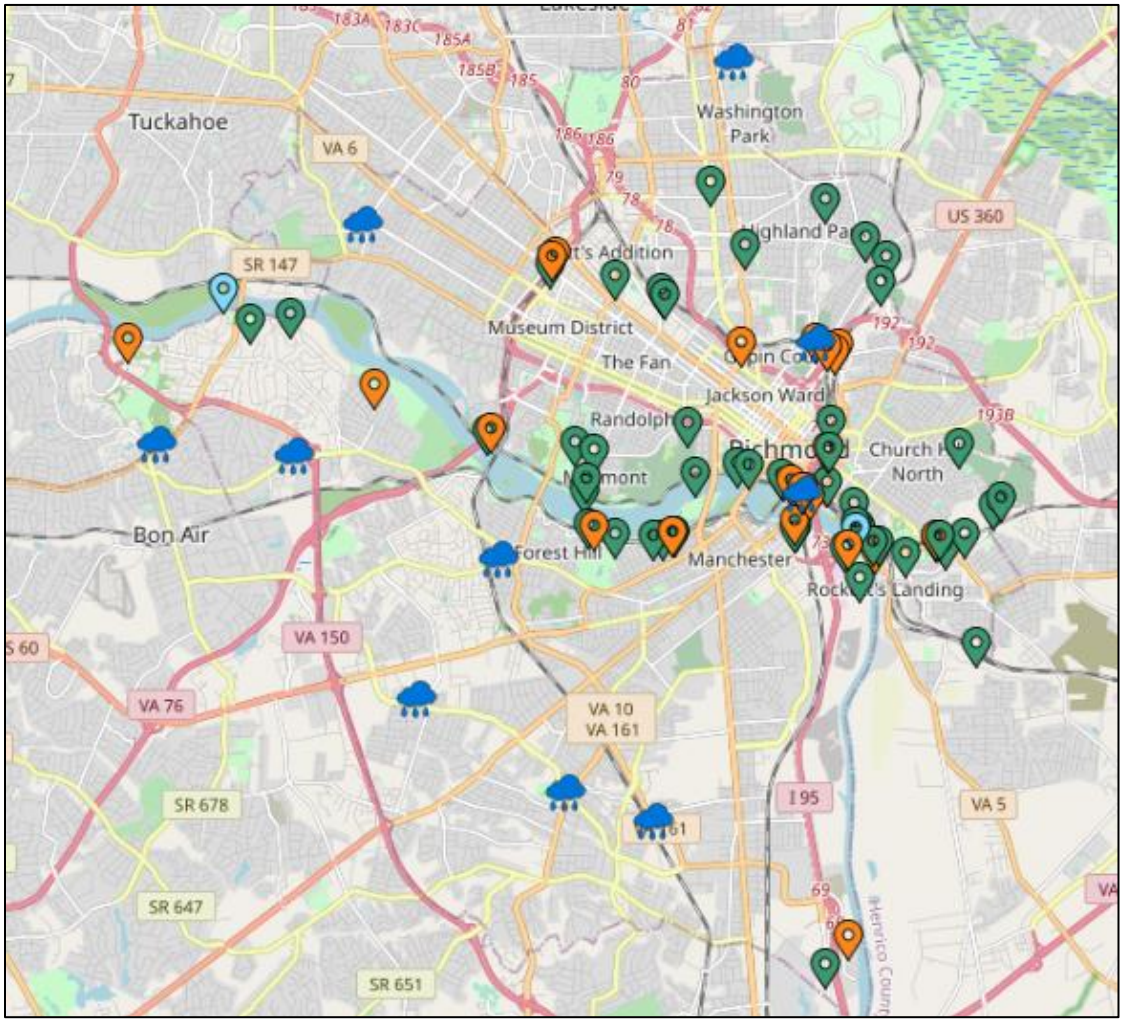

Figure 3-1: Collection System Monitoring System

The data can be displayed in real time, as shown below in Figure 3-2.

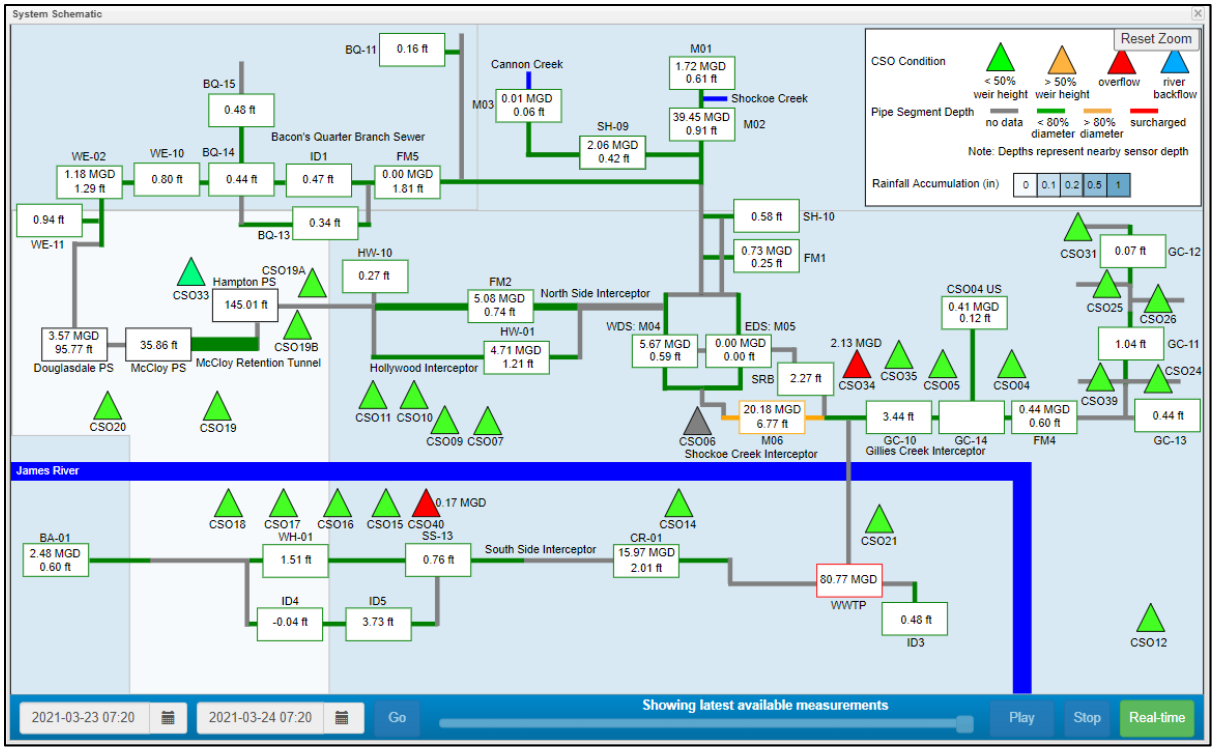

Figure 3-2: Real Time Collection System Data Display

The collected data is also utilized in the *Richmond CSO Map Notification*, which is available to the public (on the city's website) and displays outfalls that are currently overflowing or have overflowed in the past 48 hours.

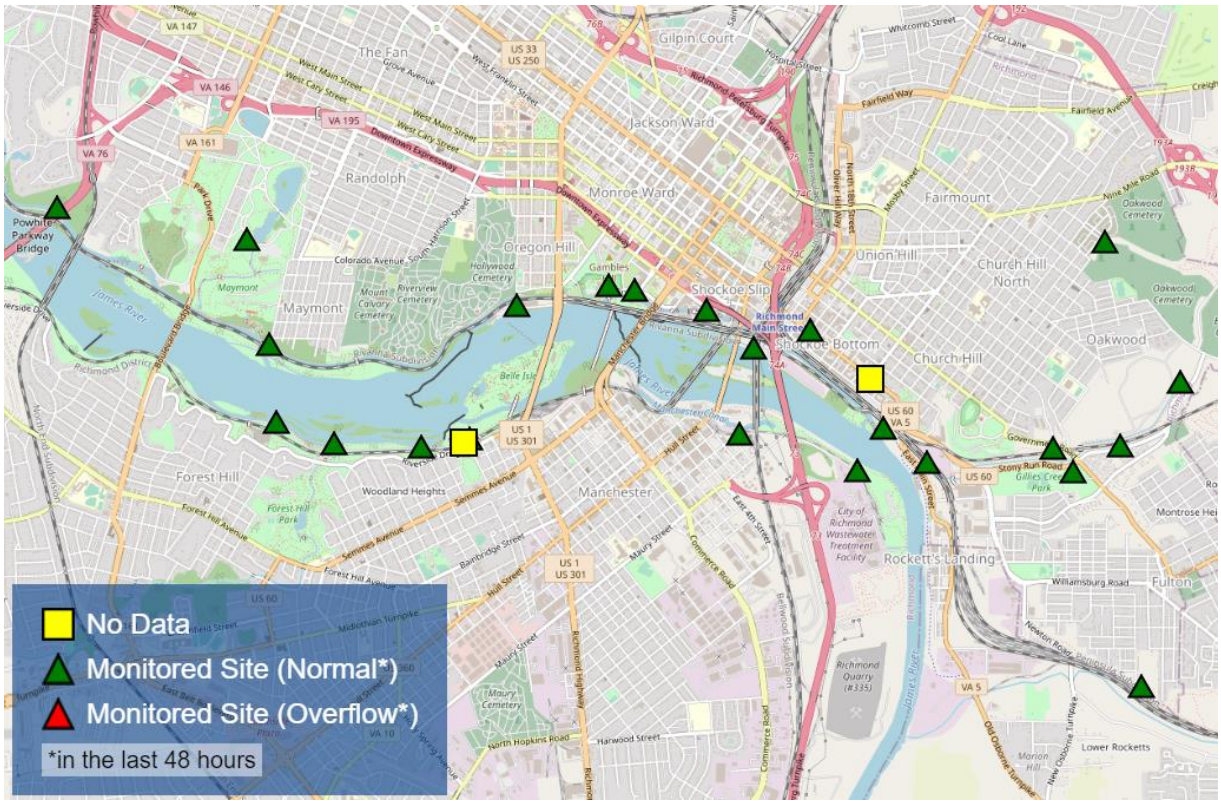

Figure 3-3: Richmond CSO Notification Map

3.3 Review of Pretreatment Program (NMC 3)

3.3.1 Changes or Use of Pretreatment Program Authority to minimize flows during CSO Events

The City administers an industrial pretreatment program as required by the VPDES permit. Industries discharging to the CSS retain stormwater on-site during wet weather events and control releases to permit limits at the WWTP. Information on individual industries which utilize retention facilities is summarized in Section 3.2.5 – Use of Public and Private Stormwater Facilities in the CSS Area. Each industry is issued an Industrial User Permit which includes a section on Discharge of Stormwater. The below statement was added to the Industrial User Permits:

> E. Storm water runoff collected within the containment dike structure shall be released to the City's Treatment System in accordance with the following criteria:
>
> 1. There shall be no discharge of floating solids, visible foam or oily sheen in other than trace amounts; and
> 2. During storm events where the accumulation of rainfall is in excess of 2.2 inches; the permittee will use the installed precipitation gauge system to determine the volume of rainfall at the terminal; which would then trigger the terminal to call the City of Richmond's Department of Public Utilities Publicly Owned Treatment Works (POTW) at (804) 646-8721 to inform them of the level of rainwater retained in the diked area. It is at this time that the POTW will advise whether the plant is able to handle your facility's effluent. Nevertheless, neither your facility's nor the POTW's welfare will be jeopardized.
> 3. The Terminal Manager shall contact the City's Environmental Compliance Officer on 804.646.8661 and notify him/her of the intent to discharge, at least 24 hours prior to initiating any discharge other than in 2 above.

During this reporting period, there have been no additional changes to the program to minimize flow during a CSO event.

3.4 Maximize Flow to the WWTP for Treatment (NMC 4)

3.4.1 Operation of WWTP during Precipitation events to show Maximization of Treatment of Wet Weather Flows

The City maximizes flow to the WWTP during wet weather events by performing the following actions:

- Influent flow at the WWTP is increased to 140 MGD in wet weather conditions (see Figure 3-4).
- Flows up to 140 MGD are treated at the WWTP to permit limits.
    - 75 MGD receives Primary, Secondary, Tertiary and UV Disinfection
    - 65 MGD receives primary treatment and UV disinfection
- Combined sewage is stored in the Shockoe Retention Basin (see Figure 3-5), Hampton/McCloy Tunnel (see Figure 3-6) and the collection system prior to overflow.
- The Shockoe Retention Basin and Hampton/McCloy tunnel are drained as soon as possible once overflow conditions are concluded. During the draining process the WWTP continues to operate at 75 MGD.

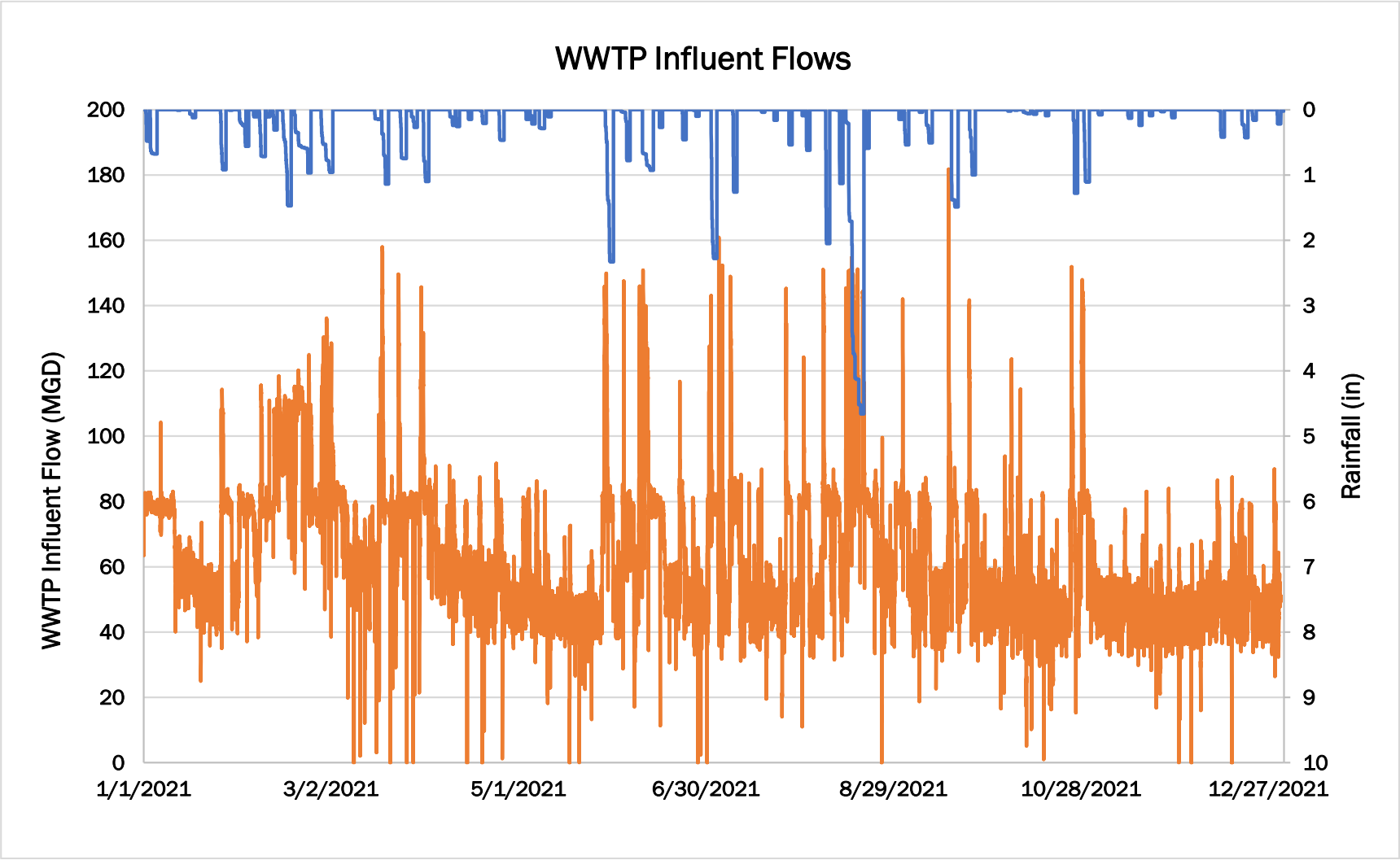

Figure 3-4: WWTP Influent Flows

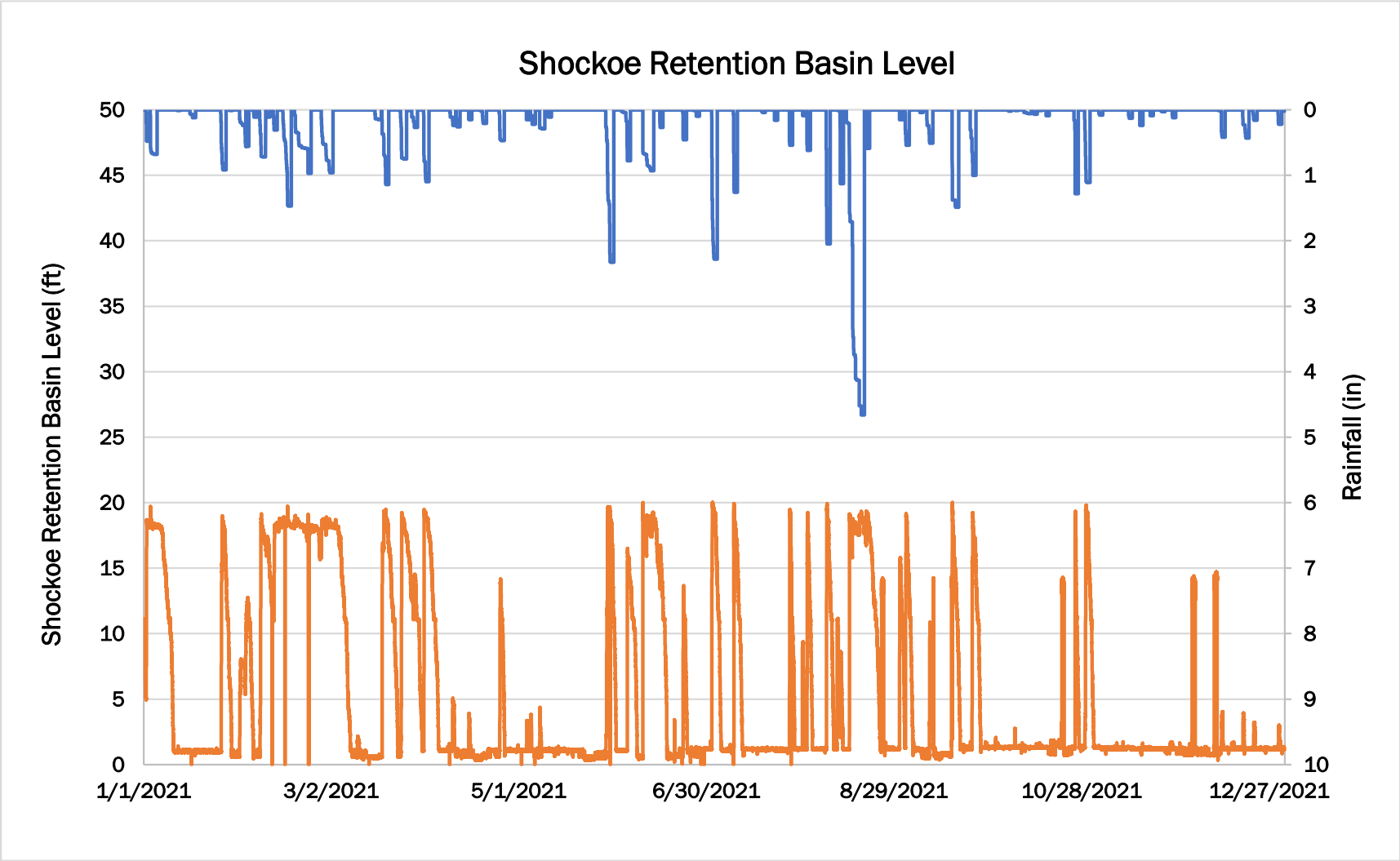

Figure 3-5: Shockoe Retention Basin Levels

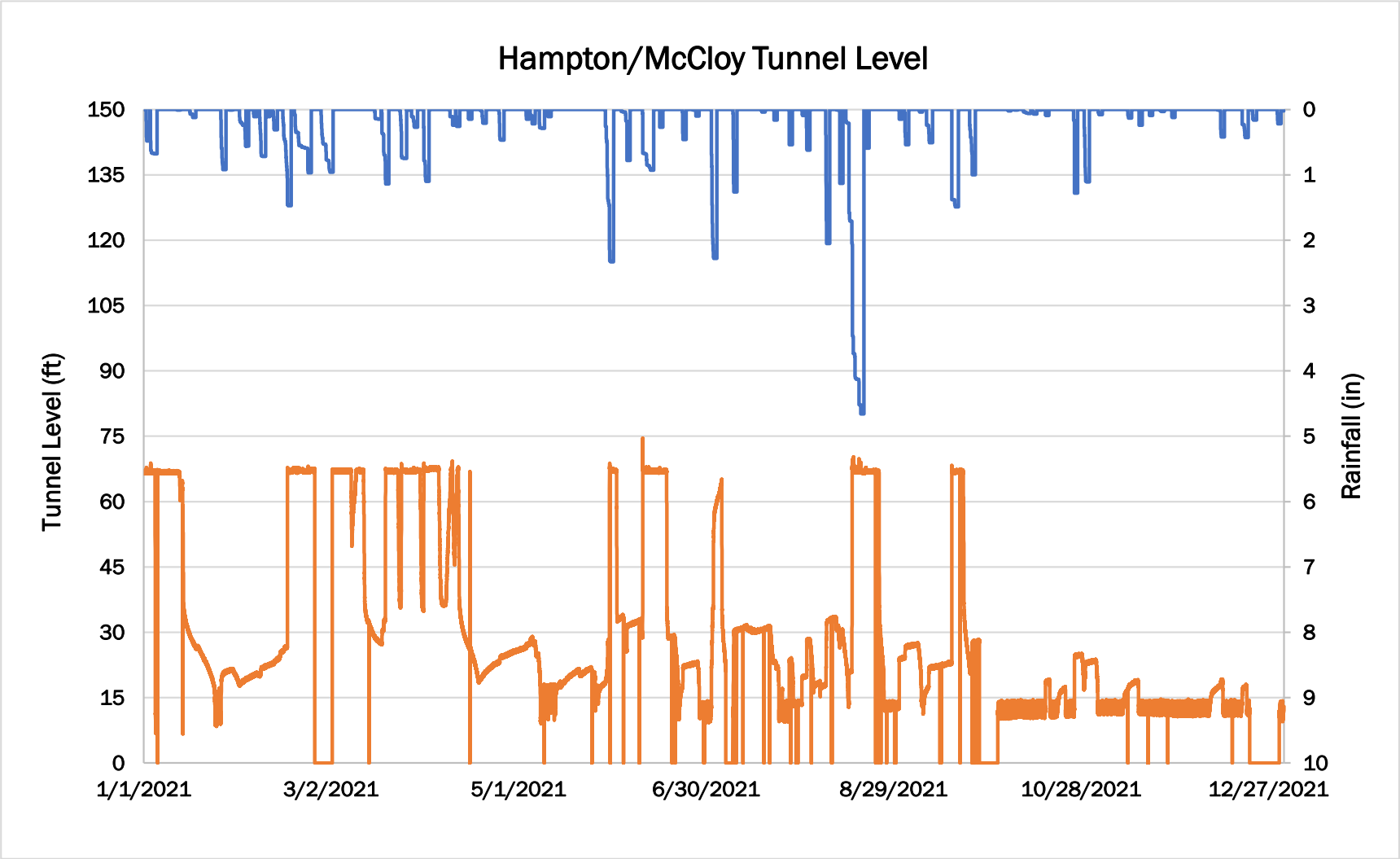

Figure 3-6: Hampton/McCloy Tunnel Levels

3.5 Eliminate Dry Weather Overflows (DWOs) (NMC 5)

3.5.1 Inspection and Maintenance of Diversion Facilities

The City regularly inspects and maintains CSS diversion facilities to prevent dry weather overflows, see Section 3.1.1.

If a dry weather discharges occurs, the City maintains an "on call" team of maintenance personnel to respond to blockages or other occurrences that could result in dry weather discharges.

3.5.2 Monitoring of Pumping Stations for DWOs

The City inspects and maintains the pump stations on a daily basis to prevent dry weather overflows, see Section 3.1.1.

If a dry weather discharges occurs, the City maintains an "on call" team of maintenance personnel to respond to blockages or other occurrences that could result in dry weather discharges.

3.5.3 Operation of the Shockoe Retention Basin

The Shockoe retention basin is continuously staffed. The basin is utilized to store combined sewage during wet weather conditions and is drained as soon as possible after overflow conditions have concluded. The 2021 operating levels of the Shockoe Retention Basin are shown in Section 3.4.1.

3.5.4 Reports of DWOs

All dry weather overflows are reported in accordance with the VPDES permit. Table 3-7 below summarizes each dry weather overflow event that occurred during the reporting period.

Table 3-7. Dry Weather Overflow Reports

Date of Incident	Location of Incident	Volume Discharged (gallons)	Event Description
3/26/21	CSO Regulator 6A	400	A blockage in the dry weather flow orifice was caused by concrete and debris. The blockage was removed.
4/14/21	306 St. David Lane	150	8-inch sewer line blocked with leaves and sticks; cleared line with sewer jet truck
4/14/21	1400 Brander Street	150	8-inch sewer line blocked with leaves and sticks; cleared line with sewer jet truck
7/23/21	1200 E Byrd Street	200	A break was identified on the 42" aerial sewer. A temporary repair was conducted on the 42" sewer.

3.6 Control Solid and Floatable Materials in the CSS (NMC 6)

3.6.1 Cleaning and Maintenance related to Control of Solid and Floatable Materials

The City implements many programs and strategies to capture and remove solid and floatable material from CSS areas. Table 3-8 below summarizes the city-wide programs conducted during the reporting period.

Table 3-8. Solid and Floatable Material Capture Programs

Program	Quantity
Loose-Leaf Collection	1,628 tons removed
Litter Basket Collection	370 tons removed
Catch Basin Cleaning	4,502 basins cleaned
Street Sweeping	5,040 miles cleaned 3,367 tons removed

Additional strategies the City implements to control solid and floatable material in CSS areas include:

- The Shockoe retention facilities provide continuous mechanical screening for over two-thirds of the CSS. Screening operations at the facilities are increased during leaf season.
    - The Shockoe Diversion Structure Trash Rake Replacement project is currently under design to replace the screening system at the Shockoe West Diversion Structure to increase the volume of the screenings removed from the facility.
- The Hampton/McCloy tunnel provides continuous mechanical screening. All flow captured in the tunnel is screened prior to transfer to the WWTP, which consist of 1,012 acres of the CSS. The tunnel is equipped with solid and floatable capture chambers.
- The Northside, Southside James River Park, Gillies Creek, and Hilton Street CSO conveyance facilities have flotation or stilling chambers and/or static screens along with baffles to capture solid and floatable material. The material captured is transferred to the intercepting sewers for removal at the WWTP.

3.7 Public Education and Outreach (MCM 1, NMC 7 and NMC 8)

3.7.1 List of High-Priority Stormwater Issues and Strategies

The City identified three high-priority stormwater issues to be addressed in their public education and outreach program.

3.7.1.1 High Priority Issue #1: Pet Waste

- Rationale for Selection: Minimize the degree of pet waste runoff to reduce the bacteria loads entering local waterways
- Identification of Public Audience: Pet Owners
- Strategy: Traditional written materials, alternative materials, signage, media materials, speaking engagements

The specific events/media utilized to address public education on Pet Waste are summarized below in Table 3-9.

Table 3-9. Strategies to Communicate High Priority Issue #1 – Pet Waste		
Date	Event/Media	Audience Reached
1/11/21 - 10/14/21	Distributed 87 Pet Waste Yard Signs to Private Citizens and Parks	
2/3/21 – 9/10/21	Installed 9 Pet Waste Stations at Parks and Private Facilities	
2/3/21 – 9/10/21	Distributed Pet Waste Bags at Parks	81,680
3/1/21	East End Green Infrastructure Collaborative	
4/20/21 – 10/11/21	Distributed Pet Waste Bags to Private Citizens	397
4/20/21	Greening Richmond Public Libraries Rain Barrel Workshop	40
6/2/21 – 10/14/21	Pet Waste Handouts to Private Citizens	7

3.7.1.2 High Priority Issue #2: General Stormwater Awareness

- Rationale for Selection: Educate residents on stormwater and its impact on the environment to improve the quality and minimize the quantity of urban runoff from residential areas
- Identification of Public Audience: Richmond citizens and school-age students
- Strategy: Traditional written materials, alternative materials, signage, media materials, speaking engagements, curriculum materials

The specific events/media utilized to address public education on General Stormwater Awareness are summarized below in Table 3-10.

Table 3-10. Strategies to Communicate High Priority Issue #2 – General Stormwater Awareness		
Date	Event/Media	Audience Reached
1/4/21	RVAgreen 2050 Environmental Working Group	Virtual
1/9/21	Household Hazardous Waste Take-Back Event	
1/11/21	Green City Commission	Virtual
1/21/21	Wild and Scenic Film Festival	Virtual
1/25/21	RVAgreen 2050 Environmental Working Group	Virtual
1/28/21	James River Advisory Council Meeting	Virtual
1/28/21	Green Infrastructure Master Plan Workshop	Virtual
2/8/21	Richmond Public Schools Professional Development Day for Environmental Science Teachers	Virtual
2/8/21	RVAgreen 2050 Environmental Working Group	Virtual
2/10/21	Shockoe Alliance Meeting	Virtual
2/18/21	Falls of the James Scenic River Advisory Committee	Virtual
2/22/21	RVAgreen 2050 Environmental Working Group	Virtual
3/1/21	East End Green Infrastructure Collaborative	Virtual
3/3/21	RVAgreen 2050 Environmental Working Group	Virtual
4/20/21	Greening Richmond Public Libraries Rain Barrel Workshop	40
9/11/21	Household Hazardous Waste Take-Back Event	300

Table 3-10. Strategies to Communicate High Priority Issue #2 – General Stormwater Awareness		
Date	Event/Media	Audience Reached
10/6/21	Wastewater Treatment Plant Tour	28
10/12/21	Virginia Society of Professional Engineers | RVAH2O Combined Sewer System Interim Plan	Virtual
11/18/21	Wastewater Treatment Plant Tour	21
12/16/21	National Association of Flood and Stormwater Management Agencies Annual Awards Presentation	Virtual
2021	Chesapeake Bay Forum	46
2021	Middle James Roundtable Annual Meeting	38
2021	Social Media: Twitter	721,000
2021	Social Media: Facebook	975
2021	Social Media: Instagram	1,286
2021	RVAH2O Website Views	10,447

3.7.1.3 High Priority Issue #3: Litter Awareness

- Rationale for Selection: Minimize the degree of litter entering the storm sewer system and local waterways to achieve higher water quality
- Identification of Public Audience: Pedestrians
- Strategy: Traditional written materials, alternative materials, signage, media materials, speaking engagements

The specific events/media utilized to address public education on Litter Awareness are summarized below in Table 3-11.

Table 3-11. Strategies to Communicate High Priority Issue #3 – Litter Awareness		
Date	Event/Media	Audience Reached
3/1/21	East End Green Infrastructure Collaborative	Virtual
4/25/21	Keep Virginia Cozy Earth Day Clean Up	97
9/11/21	James River Advisory Council Regional Cleanup	
12/16/21	National Association of Flood and Stormwater Management Agencies Annual Awards Presentation	Virtual
12/20/21	Storm Drain Art / Ripple the Library Otter	10
2021	Billboard Program: "No Trash Where We Splash"	

3.7.2 Proper Disposal of Substances - Public Education Programs and Facility Tours

The educational programs and tours conducted and/or hosted by the City during the reporting period to educated on the proper disposal of substances are summarized in Table 3-12 below.

Table 3-12. Public Education Programs and Facility Tours		
Date	Program/Tour	Audience Reached
2/8/21	Richmond Public Schools Professional Development Day for Environmental Science Teachers	Virtual
4/5/21	Wastewater Treatment Plant Tour	3
4/20/21	Greening Richmond Public Libraries Rain Barrel Workshop	40
5/29/21	Wastewater Treatment Plant Tour	6
7/23/21	Wastewater Treatment Plant Tour	9
8/14/21	Wastewater Treatment Plant Tour	10
10/6/21	Wastewater Treatment Plant Tour	28
10/12/21	Virginia Society of Professional Engineers | RVAH2O Combined Sewer System Interim Plan	Virtual
10/25/21	Wastewater Treatment Plant Tour	8
11/18/21	Wastewater Treatment Plant Tour	21
12/16/21	National Association of Flood and Stormwater Management Agencies Annual Awards Presentation	Virtual

3.7.3 Pretreatment Awareness Programs

The pretreatment awareness programs that were implemented to encourage industrial waste reduction through recycling and improved housekeeping are summarized in Table 3-13 below.

Table 3-13. Awareness Programs to Encourage Waste Reduction		
Date	Event/Program	Audience Reached
1/9/21	Household Hazardous Waste Take-Back Event	25
9/11/21	Household Hazardous Waste Take-Back Event	300

3.8 Public Involvement and Participation (MCM 2 and NMC 8)

3.8.1 Public Input on MS4 Program

Stormwater complaints received by the City, and complaints that were addressed and closed out through the duration of the reporting period are summarized in Table 3-14 below.

Table 3-14. Stormwater Complaints Summary (Cityworks)	
No. of New Complaints Received	1,958
No. of Complaints Closed	1,384

3.8.2 Published Information on a City-Controlled website pertaining to the CSO Control and MS4 Program

Published information on the CSO control and MS4 programs is located at the following City-controlled websites:

https://www.rva.gov/index.php/public-utilities/wastewater-utility

https://www.rva.gov/public-utilities/stormwater-management

3.8.3 Public Involvement Activities

The public involvement activities conducted and/or hosted by the City during the reporting period are summarized in Table 3-15 below.

Table 3-15. Public Involvement Activities

Date	Event	Attendees	Water Quality Improvement
1/4/21	RVAgreen 2050 Environmental Working Group	Virtual	Discussed the development of the RVAGreen 2050 Plan, which will include plans to install Green Infrastructure to reduce nutrients and sediment in runoff
1/11/21	Green City Commission	Virtual	Discussed the development of the RVAGreen 2050 Plan, which will include plans to install Green Infrastructure to reduce nutrients and sediment in runoff
1/25/21	RVAgreen 2050 Environmental Working Group	Virtual	Discussed the development of the RVAGreen 2050 Plan, which will include plans to install Green Infrastructure to reduce nutrients and sediment in runoff
1/28/21	James River Advisory Council Meeting	Virtual	Shared information about stormwater runoff and water quality
2/8/21	Richmond Public Schools Professional Development Day for Environmental Science Teachers	Virtual	Shared information about stormwater runoff and water quality
2/8/21	RVAgreen 2050 Environmental Working Group	Virtual	Discussed the development of the RVAGreen 2050 Plan, which will include plans to install Green Infrastructure to reduce nutrient and sediment runoff
2/10/21	Shockoe Alliance Meeting	Virtual	Discussed the developed of the Richmond Green Infrastructure Master Plan, which will include plans to install Green Infrastructure to reduce nutrients and sediment in runoff
2/18/21	Falls of the James Scenic River Advisory Committee	Virtual	Shared information about stormwater runoff and water quality
2/22/21	RVAgreen 2050 Environmental Working Group	Virtual	Discussed the development of the RVAGreen 2050 Plan, which will include plans to install Green Infrastructure to reduce nutrients and sediment in runoff
3/3/21	RVAgreen 2050 Environmental Working Group	Virtual	Discussed the development of the RVAGreen 2050 Plan, which will include plans to install Green Infrastructure to reduce nutrients and sediment in runoff
4/14/21	VA AWWA Communications Committee Meeting	Virtual	Shared information about stormwater runoff and water quality
4/20/21	Greening Richmond Public Libraries Rain Barrel Workshop	40	Distributed 40 rain barrels and 40 pet waste bags
4/25/21	Keep Virginia Cozy Earth Day Clean Up	97	97 volunteers; Distributed 49 big stickers, 7 pouches, and 82 seed pencils
9/11/21	James River Advisory Council Regional Cleanup		Shared information about stormwater runoff and water quality in the James River
10/6/21	Wastewater Treatment Plant Tour	28	Shared information about water quality
11/18/21	Wastewater Treatment Plant Tour	21	Distributed 15 RVAH2O goodie bags containing RVAH2O pouches, big and small RVAH2O stickers, and Only Rain in the Drain stickers in RVAH2O paper bags

3.8.4 Public Involvement Metric Evaluation

The metrics used to evaluate the effectiveness of the implemented public involvement activities are summarized in Table 3-16 below.

Table 3-16. Public Involvement Activities

Public Involvement Opportunity Outlined in Program Plan	Metric as Defined in Program Plan	Metric Measurements	Evaluation
Monitoring – Volunteer Monitoring	The number of participants per training event	No volunteer samples were conducted during the 2021 reporting year.	Volunteer sampling was suspended comply with COVID-19 protocols.
Restoration – Watershed Cleanup	The number of participants per event	4/25/21 "Keep Virginia Cozy Earth Day Clean Up" - 97 volunteers	In 2021, the Department of Public Utilities sponsored Keep Virginia Cozy. The cleanup effort had the participation of 97 volunteers. 189 pounds of recycling and 722 pounds of litter were collected.
Disposal or Collection Event – Household Hazardous Waste Collection Events	The number of barrels of hazardous waste collected per event	1/9/21 and 9/11/21 at Broad Rock Sports Complex	7,290 lbs of hazardous household material was collected over the two events. Keeping hazardous material from being improperly disposed of and out of the environment, our stormwater, our combined stormwater and sewer infrastructure, and out of waterways is beneficial to improving and protecting water quality.

3.8.5 Public Meetings Organized/Attended

During the reporting period, the City organized and participated in meetings with the community, regulatory agencies, stakeholders, and other MS4 permittees. These meetings are summarized in Table 3-17 below.

Table 3-17. Public Involvement Meetings

Date	Meeting
1/4/21	RVAgreen 2050 Environmental Working Group
1/11/21	Green City Commission
1/25/21	RVAgreen 2050 Environmental Working Group
1/28/21	James River Advisory Council Meeting
2/8/21	Richmond Public Schools Professional Development Day for Environmental Science Teachers
2/8/21	RVAgreen 2050 Environmental Working Group
2/10/21	Shockoe Alliance Meeting
2/18/21	Falls of the James Scenic River Advisory Committee
2/22/21	RVAgreen 2050 Environmental Working Group
3/3/21	RVAgreen 2050 Environmental Working Group
4/14/21	VA AWWA Communications Committee Meeting

Table 3-17. Public Involvement Meetings	
Date	Meeting
4/20/21	Greening Richmond Public Libraries Rain Barrel Workshop
4/25/21	Keep Virginia Cozy Earth Day Clean Up
9/11/21	James River Advisory Council Regional Cleanup

3.8.6 CSO Warning Signs

Twenty (20) of the twenty-five (25) CSO outfalls were predicted to discharge, more than once per summer on average. Each of these outfalls are required to have a CSO warning sign per the VPDES permit. These signs have been installed and have been maintained by DPU throughout the reporting year.

3.8.7 Local Press Coverage of CSO Program

Local press coverage of the CSS is ongoing. The articles/sessions released during the reporting period are summarized in Table 3-18 below.

Table 3-18. Local Press Coverage		
Date	Source	Link
1/2/21	Richmond Times Dispatch	https://richmond.com/opinion/columnists/peggy-sanner-column-trees-are-improving-communities-virginia-legislators-can-help/article_18360971-7b69-52bd-9732-51e57ea5cbbe.html
1/7/21	Chesapeake Bay Foundation	https://www.cbf.org/blogs/save-the-bay/2021/01/trees-are-improving-communities-and-virginia-legislators-can-help.html
1/20/21	DPU Blog	https://cordpu.blogspot.com/2021/01/deadline-extended-cares-municipal.html?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+CityOfRichmondDepartmentOfPublicUtilities+%28City+of+Richmond+Department+of+Public+Utilities%29
1/22/21	Good Morning RVA	https://gmrva.com/podcast/2021/1/22/good-morning-rva-4013-79-vaccine-shortage-and-resiliency-gardens
1/25/21	Good Morning RVA	https://gmrva.com/podcast/2021/1/25/good-morning-rva-3792-1-a-keep-kamras-column-and-progress-on-the-slavery-memorial
1/26/21	Good Morning RVA	https://gmrva.com/podcast/2021/1/26/good-morning-rva-6172-3-fy22-budget-calendar-and-pink-paint
2/4/21	James River Association	https://thejamesriver.org/press-release-the-james-river-association-finds-new-ways-to-educate-students/
2/9/21	VPM	https://vpm.org/news/articles/20255/restoration-of-richmonds-rattlesnake-creek-cancelled
2/25/21	DPU Blog	https://cordpu.blogspot.com/2021/02/do-you-have-flood-insurance.html?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+CityOfRichmondDepartmentOfPublicUtilities+%28City+of+Richmond+Department+of+Public+Utilities%29
4/6/21	Richmond SPCA Blog	https://richmondspca.org/2021/04/06/guest-blog-rva-h20-scoop-the-poop/
4/13/21	Potomac Local News	https://potomaclocal.com/2021/04/13/farr-plucked-from-richmond-to-lead-prince-william-water-utility/
4/29/21	WTVR	
6/10/21	WRIC ABC8	https://www.wric.com/news/local-news/richmond/what-about-us-residents-on-richmonds-southside-ask-for-solution-after-widespread-flooding/

Table 3-18. Local Press Coverage		
Date	**Source**	**Link**
6/10/21	CBS6	https://www.wtvr.com/news/local-news/southside-flooding-issue-comes-with-pricey-solution
7/8/21	Richmond Times Dispatch	https://richmond.com/news/state-and-regional/govt-and-politics/richmond-asking-883-million-for-long-term-fix-to-sewage-overflows/article_b9e01d06-bd97-5b03-a304-9162e1ce3eee.html
7/8/21	Virginia Mercury	https://www.virginiamercury.com/2021/07/08/helicopters-cash-payments-and-a-new-public-health-lab-how-state-agencies-propose-spending-virginias-rescue-fund-money/
7/9/21	Riverside Outfitters	
7/10/21	Richmond Times Dispatch	https://richmond.com/opinion/letters/letter-to-the-editor-july-10-2021-dont-use-federal-funds-to-repair-sewage-systems/article_829ec91c-99ba-5de7-b28f-1859c1b5d538.html
7/11/21	Richmond Times Dispatch	https://richmond.com/opinion/letters/letter-to-the-editor-july-11-2021-feds-should-not-pay-to-fix-citys-problem/article_6872e60e-3e56-596d-b8bd-2b93920ba373.html
7/13/21	Chesapeake Bay Magazine	https://chesapeakebaymagazine.com/three-bay-watershed-cities-ask-va-for-1-4-billion-in-wastewater-fixes/
8/13/21	Virginia Mercury	https://www.virginiamercury.com/2021/08/13/125m-puts-meaningful-dent-in-plans-to-halt-sewage-flow-into-virginia-rivers/
8/13/21	Good Morning RVA	https://mailchi.mp/gmrva/good-morning-rva-more-shots-more-data-more-sewers?e=f573361da9
8/14/21	Vienna and Oakton Connection	http://www.viennaconnection.com/news/2021/aug/14/opinion-commentary-virginia-legislature-decides-fu/
8/20/21	Chesapeake Bay Journal	https://www.bayjournal.com/news/policy/virginia-special-session-secures-more-funds-for-clean-water/article_bec97642-01e3-11ec-8d12-0fc74cd6dae9.html
8/20/21	Virginia Mercury	https://www.virginiamercury.com/2021/08/20/yes-virginia-we-are-seeing-more-and-more-intense-rainfall/
8/20/21	Fauquier Now	https://www.fauquiernow.com/fauquier_news/article/fauquier-yes-virginia-rainfall-growing-more-intense-rainfall-8-2021
8/25/21	Patch	https://patch.com/maryland/annapolis/virginia-special-session-secures-more-funds-clean-water
9/3/21	Good Morning RVA	https://mailchi.mp/gmrva/good-morning-rva-first-to-go-up-last-to-come-down-combined-sewer-overflows-and-snapping-a-streak?e=f573361da9
9/9/21	Good Morning RVA	https://mailchi.mp/gmrva/good-morning-rva-whats-next-pipeline-updates-and-west-broad-street-green?e=f573361da9
9/9/21	Good Morning RVA	https://mailchi.mp/gmrva/good-morning-rva-whats-next-pipeline-updates-and-west-broad-street-green?e=f573361da9
9/16/21	WRIC ABC8	https://www.wric.com/news/local-news/richmond/flash-floods-wallop-downtown-richmond-eyewitness-videos-detail-damage/
9/17/21	Good Morning RVA	https://mailchi.mp/gmrva/good-morning-rva-qr-codes-our-sewer-is-old-and-in-person-early-voting?e=f573361da9
9/21/21	Richmond Magazine	https://richmondmagazine.com/news/a-big-fish-story/
10/6/21	WRIC ABC8	https://www.wric.com/news/local-news/richmond/over-1-million-in-grant-funding-awarded-to-richmond-flood-preparedness-projects/
10/21/21	RVAHUB	https://rvahub.com/2021/10/21/rvah2o-now-giving-the-people-the-straight-poop-on-sewer-overflows/
10/22/21	CBS6	https://www.youtube.com/watch?v=zos_uQFxd0w
10/22/21	CBS6	https://www.wtvr.com/news/local-news/richmond-sewer-monster
11/7/21	Richmond Times Dispatch	https://richmond.com/news/local/richmonders-can-now-track-the-cleanliness-of-the-james-river-in-real-time/article_9b81390b-4908-5496-b268-8f77fbf66c2c.html#tracking-source=home-top-story

Table 3-18. Local Press Coverage		
Date	**Source**	**Link**
11/8/21	Good Morning RVA	https://mailchi.mp/gmrva/good-morning-rva-new-bike-lanes-new-map-and-pipeline-is-back?e=f573361da9
11/9/21	Chesapeake Bay Magazine	https://chesapeakebaymagazine.com/new-james-river-mapping-tool-shows-sewage-overflows-in-real-time/
11/17/21	Richmond Times Dispatch	https://richmond.com/opinion/letters/letters-to-the-editor-for-nov-18-2021-citys-sewer-overflow-tool-a-good-step/article_2fc8d7a7-f093-5cda-923a-e53411a72074.html
11/29/21	WYMT	https://www.wymt.com/2021/11/30/virginia-department-health-establishes-sentinel-monitoring-network/
12/3/21	DCist	https://dcist.com/story/21/12/03/sponsored-a-tale-of-two-tunnels-cso-control-in-the-district-and-boston/
12/6/21	The Roanoke Times	https://roanoke.com/news/state-and-regional/environmental-groups-sue-henrico-county-over-james-river-pollution/article_09a7a5da-56cb-11ec-a376-577d89957499.html
12/6/21	Virginia Mercury	https://www.virginiamercury.com/2021/12/06/environmental-groups-sue-henrico-county-over-chronic-sewage-violations/
12/6/21	CBS6	https://www.wtvr.com/news/local-news/environmental-groups-sue-henrico-county-over-raw-sewage-violations
12/6/21	Richmond Times Dispatch	https://richmond.com/news/local/federal-lawsuit-from-conservation-groups-calls-for-henrico-county-to-end-decades-of-pollution-in/article_0777c86c-cdd6-5f58-9742-c2e426067c39.html
12/7/21	RVAHUB	https://rvahub.com/2021/12/07/environmental-groups-sue-henrico-county-over-chronic-sewage-violations/
12/7/21	Good Morning RVA	https://mailchi.mp/gmrva/good-morning-rva-collective-bargaining-james-river-sewage-and-a-potential-raise-for-teachers?e=f573361da9
12/9/21	Chesapeake Bay Journal	https://www.bayjournal.com/news/pollution/virginia-county-sued-over-chronic-sewage-leaks-into-james-river-system/article_c1cb9de6-5910-11ec-92e1-8794d7ba9169.html
12/10/21	Patch	https://patch.com/maryland/annapolis/virginia-county-sued-over-chronic-sewage-leaks-james-river-system
12/15/21	Richmond Times Dispatch	https://richmond.com/news/state-and-regional/govt-and-politics/northams-budget-includes-funds-for-richmonds-outdated-sewer-system-millions-to-restore-chesapeake-bay/article_5cea9f36-1a1b-5b55-9a32-476e0cd6d47e.html
12/16/21	Good Morning RVA	https://mailchi.mp/gmrva/good-morning-rva-omicron-closures-sprawl-and-sewer-investments?e=f573361da9
12/25/21	Richmond Times Dispatch	https://richmond.com/opinion/columnists/ralph-hambrick-column-for-the-james-rivers-future-the-past-as-incentive/article_62a8e8fb-40f6-5767-a297-2aa641ccc408.html

3.8.8 Awards

The City received the following awards in 2021 for their work to improve water quality and their communication efforts:

- "2021 National Environmental Achievement Award from the National Association of Clean Water Agencies, Public Information and Education E-Media, RVAH2O's Floodwall Twitter Thread and Online Outreach"

Figure 3-7: NACWA Poster for Floodwall Twitter Thread

- "2021 Virginia Water Environment Association, A. H. Paessler Environmental Stewardship Award, Eric Whitehurst"

- "2021 National Association of Flood & Stormwater Management Agencies, Excellence in Communications Awards, First Place, Improving Water Quality Campaign, RVAH2O's "No Trash Where We Splash" Billboard Campaign"

- "2021 Virginia American Water Works Association, Public Information Awards, Social Media & Issues and Crisis Management Categories, RVAH2O's 2020 Floodwall Closure Twitter Thread and Social Media Posts"

3.9 Illicit Discharge Detection and Elimination (MCM 3)

3.9.1 MS4 Map and Information Confirmation Statement

The MS4 map and information table are up to date as of December 31st of the reporting period, and is presented in Appendix B.

3.9.2 Outfall Screening Summary

The total number of outfalls screened during the reporting period as part of the dry weather screening program is summarized in Table 3-19 below. The 2021 reporting period outfall inventory records are provided in Appendix C.

Table 3-19. Outfall Screening Summary		
Creek	No. of Outfalls	IDDE Potential
Reedy Creek	54	53 Unlikely 1 Potential
Broad Rock Creek	42	42 Unlikely
Along Creek	45	45 Unlikely

3.9.3 MS4 Illicit Discharges

The City investigated 16 illicit discharges during the reporting period. A summary of the illicit discharges to the MS4 is included in Appendix D.

3.10 Construction Site Stormwater Runoff Control (MCM 4)

3.10.1 Summary of Inspections

The inspections conducted at construction sites during the reporting period are summarized in Table 3-20 below.

Table 3-20. Summary of Construction Site Stormwater Inspections		
Total Conducted	Enforcement Actions	
	Type	Total
1,843	Notice to Comply	42
	Stop Work Order	3
	Notice of Violation	0

3.11 Post-Construction Stormwater Management for New Development and Development on Prior Developed Lands (MCM 5)

3.11.1 Summary of Inspections of Stormwater Management Facilities

The inspections conducted on privately owned and permittee owned stormwater facilities during the reporting period are summarized in Table 3-21 below.

Table 3-21. Summary of Stormwater Management Facility Inspections		
Stormwater Management Facility	Total Inspections Conducted	Enforcement Actions
Privately-Owned	91	5 Notice to Comply enforcement actions issued for general housekeeping duties
Public/Permittee-Owned	87	No enforcement actions taken

3.11.2 Summary of Maintenance Activities

The City did not perform any significant maintenance activities on stormwater management facilities throughout the 2021 reporting year. The City performs regular inspections and maintenance activities on City owned and operated stormwater management facilities that includes grass cutting, trash collection, and debris removal.

3.11.3 Submission Confirmation Statements

The Water Resources Division staff of DPU has submitted stormwater management facility information through the Virginia Construction Stormwater General Permit database, and have reported BMPs through the DEQ Warehouse.

3.12 Pollution Prevention and Good Housekeeping for Facilities Owned and Operated by the Permittee within the MS4 Service Area (MCM 6 and NCM 7)

3.12.1 Summary of New or Modified Operational Procedures

In the 2021 reporting year the following operational procedures have been modified or implemented:

- Expansion of the Illicit Discharge Detection and Elimination Program with the standardization of forms, and increased numbers of inspections and follow-up inspections

3.12.2 Summary of New or Modified SWPPPs

No updates were made to the existing SWPPP's during the 2021 reporting year. Training is performed based on the operations outlined in the SWPPP's.

3.12.3 Summary of New Turf and Landscape Nutrient Management Plans

No new Turf and Landscape Plans have been implemented within the City.

3.12.4 Summary of Training Events

The City has conducted a training program for stormwater awareness for city employees. The program provides education on spill prevention, vehicle maintenance, bulk material storage, road and parking lot maintenance and facility maintenance. A total of three training sessions were provided throughout the 2021 reporting period to 397 attendees.

3.12.5 Operation and Maintenance of Septage Receiving Station

In the 2021 reporting year, the City received 2,468 hauled waste discharges for a total of 3.04 million gallons. The Septage Receiving Station is inspected daily and is maintained at regular intervals.

3.12.6 Enforcement of Ordinances that prohibit substances from entering the Collection System

In the 2021 reporting year, the City performed the following activities:

- Collected 2,360 samples through the Strong Waste Surcharge Program
    - Issued five Notices of Violations to Significant Industrial Users

  Performed 19 inspections at Significant Industrial Users Facilities

Section 4
Chesapeake Bay TMDL Action Plan Status Report

4.1.1 Implemented BMPs

The BMPs that have been implemented by the City to achieve compliance with Chesapeake Bay TMDL Action Plan are summarized in Table 4-1. The City has not acquired any credits during the 2021 reporting year.

Table 4-1. Summary of Implemented BMPs

BMPs	Completion Date	Pollutant Removal (lbs/year)		
		Total Nitrogen	Total Phosphorus	Total Suspended Solids
Maury Stream Restoration	2016	894.0	176.0	58,720.0
Green Alleys	2016	5.7	1.5	702.0
BMPs	2017	80.2	17.4	5,088.1
Cherokee Lake and Croatan Road	2018	872.4	198.2	16,679.8
Forest Hill	2018	1,354	298.8	25,154.9
Little Westham Creek	2019	3,180.0	1,224.0	422,000.0
Pocosham Creek	2019	4,696.0	1,061.0	354,013.0

4.1.2 Chesapeake Bay TMDL Action Plan Compliance Progress

The City's progress towards meeting the required pollutant load reductions are summarized in Table 4-2.

Table 4-2. City's Chesapeake Bay TMDL Action Plan Compliance Progress						
Goal	Pollutant (lbs/year)					
	Total Nitrogen		Total Phosphorus		Total Suspended Solids	
Removal to Date (End of 2021 Reporting Year)	11,082.2		2,976.8		882,357.8	
2018 Goal	633.7	1,749%	145.5	2,046%	64,646.4	1,365%
2023 Goal	4,852.7	228.4%	1,038.0	286.8%	456,385.5	193.3%
2028 Goal	12,085.0	91.7%	2,568.0	115.9%	1,134,901.2	77.7%

4.1.3 Future Planned BMPs

The BMPs that are scheduled to be constructed in the future are summarized in Table 4-3.

Table 4-3. Summary of Future Planned BMPs				
BMPs	Completion Date	Pollutant Removal (lbs/year)		
		Total Nitrogen	Total Phosphorus	Total Suspended Solids
Pinecamp Stream Restoration	2023	8,091.0	3,778.0	4,620,047.0

Section 5

Local TMDL Action Plan Status

The City has an approved James River Bacteria TMDL Action Plan dated 11/04/2010. The City has continued to implement the CSO program nine minimum control standards and the MS4 six minimum control standards to reduce the pollutants of concern.

In 2020, the Virginia General Assembly passed, and the Governor signed into law, the 2020 CSO Law, that requires the owner or operator of any CSS east of Charlottesville that discharges into the James River watershed to submit to DEQ an Interim and Final Plan to address the requirements of any consent special order issued by the Board.

The 2020 CSO Law identifies the following dates and tasks for the owner or operator:

	Purpose	Due Date	Initiate Construction and Related Activities	Complete Construction and Related Activities
Interim Plan	Identify improvements that can be initiated in the short-term	July 1, 2021	July 1, 2022	July 1, 2027
Final Plan	Re-evaluates the remaining Special Order projects and identifies system-wide improvements	July 1, 2024	July 1, 2025	July 1, 2035
TMDL Report	Identify improvements to meet the requirements of the "James River – Richmond Tributaries Bacteria TMDL"	July 1, 2030	NA	NA

The City completed the development of the Interim Plan in June 2021. The following ten Interim Plan Projects are currently in design, and are estimated to reduce the annual combined sewage overflow volume by 182 MG.

Table 5-1. Summary of Selected Interim Plan Projects						
PROJECT		PROJECT PURPOSE	Overflow Volume Reduction (MG)	Capital Cost ($M)	$/Gal Reduction	Construction Completion Date
In-Line Storage						
1	CSO 21	Replacement of the Regulator to utilize upstream in-line storage in the Gordon Avenue Sewer (approx. 1.5 MG of storage)	16.2	$5.4	$0.33	2025
2	CSO 40 #1	Installation of a new structure to utilize upstream in-line storage in the CSO 1/2 Pipeline (approx. 1.1 MG of storage)	12.3	$3.8	$0.31	2025
Diversion						
3	CSO 19A	Divert flow between the Hampton/McCloy Retention Tunnel and the Shockoe Retention Basin	10.3	$0.8	$0.08	2026
4	CSO 19B		2.2	$0.3	$0.14	2022
5	CSO 20		8.9	$0.8	$0.09	2026
Dynamic Underflow Control						
6	CSO 04	Relocation of the Regulator, to utilize upstream in-line storage and send additional flow to the Gillies Creek Interceptor	5.1	$8.7	$1.71	2024
7	CSO 24	Divert additional wet weather flow to the Gillies Creek Interceptor	3.8	$0.4	$0.11	2024
8	CSO 39		3.6	$0.8	$0.22	2024
Controls Updates						
9	Level 1 Controls	Automation of the drainage operation at the Shockoe Retention Basin and control improvements at the McCloy PS	78.7	$1.3	$0.02	2023
10	Level 2 Controls	Improvements of the WWTP Main Pumping Station to optimize the operation of the 65 MGD Wet Weather UV Disinfection Facility	41.2	$11.0	$0.27	2025
All Interim Plan Projects (10)			182.3 MG	$33.3M	$0.18/gal	

The development of the Final CSO Plan is still underway.

Section 6

James River and Tributary Monitoring Report

Virginia Commonwealth University (VCU) conducts water quality monitoring in the James River and its tributaries on behalf of the City. The data collected by VCU is provided in Appendix E.

Appendix A: Richmond CSS Map

Appendix B: Richmond MS4 Map

Appendix C: Outfall Inventory Records

Appendix D: Illicit Discharge Records

Appendix E: James River and Tributary Monitoring Data