Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Michael S. Rolband, PE, PWD, PWS Emeritus
Director
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VIA ELECTRONIC MAIL

To:

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The Honorable Tony Wilt
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From: Mike Rolband

Date: December 27, 2023

Subject: Richmond Combined Sewer Overflow Outfall Progress Report (2023)

In accordance with the 2020 Virginia Acts of Assembly Chapter 634, the Department of Environmental Quality is transmitting the attached City of Richmond 2023 Combined Sewer System General Assembly Report.

If you have any questions concerning this report or would like a hard copy of this report, please contact Brandon Bull, Director – Policy, at (804) 698-4092.

CITY OF RICHMOND
Department of Public Utilities
Office of the Director

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November 1, 2023

The Honorable Michael Rolband, Director
Virginia Department of Environmetnal Quality
1111 East Main Street, Sutie 1400
Richmond, VA 23219

Subject: City of Richmond 2023 Combined Sewer System General Assembly Report

Dear Director Rolband:

Enclosed is the City of Richmond's report outlining the efforts undertaken to address the Interim and Final Plans for its combined sewer system.

Thank you for your continuous support of the City of Richmond.

Sincerely,

April N. Bingham, MPA
Director

From the desk of April N. Bingham, Director
City of Richmond Department of Public Utilities
730 East Broad Street, 6th Floor, Richmond, VA 23219

November 1, 2023

The Honorable Michael Rolband, Director
Virginia Department of Environmental Quality (VADEQ)
1111 East Main Street, Suite 1400, Richmond, VA 23219

Subject: City of Richmond 2023 Combined Sewer System General Assembly Report

Dear Director Rolband:

In accordance with the State Water Control Board Enforcement Action Amendment to the Special Order by Consent (Consent Order), and the Acts of Assembly Chapter 634, the City of Richmond (City) is pleased to submit this report on the efforts it has undertaken to address the Interim and Final Plans for its combined sewer system (CSS). This report provides demonstration that the City will meet its regulatory obligations, and in doing so, will provide central Virginia with cost-effective engineered solutions that will further protect and enhance the environment and in the vitally important James River.

The City is conducting ongoing operation and maintenance enhancements, implementing projects identified in the Interim Plan, and developing the Final Plan as required by the Consent Order and Chapter 634 (Acts of Assembly). These activities are taking place simultaneously, requiring the City to apply tremendous resources of both funding and staff. As the City advances these major projects despite ongoing workforce and logistical/supply chain challenges we are, at the same time, capturing efficiencies to ensure there is a significant and clear benefit to the environment and the James River.

This 2023 General Assembly Report will provide updates on:

- Interim Plan implementation
- Final Plan development
- Other ongoing CSS Clean Water projects
- Community engagement and outreach
- Costs and funding sources

TABLE OF CONTENTS

FIGURES

COLOR KEY

Throughout this report, Interim Plan projects and processes are indicated in green, Final Plan projects and processes are indicated in blue, and other CSS Operations and Maintenance projects are indicated in orange.

EXECUTIVE SUMMARY

The James River is the City of Richmond's **most valuable natural resource.**

Residents, businesses, and visitors rely upon the James River as a water supply source, an economic driver, and a recreational resource. The City has undertaken significant projects over the past 50 years to protect and preserve this resource while parterning with our stakeholders to help identify and prioritize ways to enhance the river.

The CSS projects required by the Consent Order build upon the efforts the City already has underway. However, this requires additional projects and costs, and an accelerated timeline. The City values its partnership with the General Assembly and DEQ in focusing on such improvements to the James River, and the funding and incentives necessary to implement those improvements.

As this report reflects, the City is on schedule with construction of the Interim Plan projects. The Final Plan is in development, with a focus on addressing the City's largest CSO source, the Shockoe drainage area. Thanks to the General Assembly's support, there are some significant projects under consideration as part of the Final Plan.

The City's immediate next steps include:

- Completion of construction of the Interim Plan projects
- Evaluation and selection of the Final Plan solutions
- Continued implementation of other clean water projects
- Ongoing robust engagement with the Public Stakeholder Group and Richmonders at large

Construction of the Wastewater Treatment Plant's new Screening and Grit Building, which will remove harmful debris before entering the treatment facility, August 29, 2023.

Construction of Outfall 004 Interim Plan Project will reduce annual overflow events at this location by 95%, August 1, 2023.

SECTION A: BACKGROUND

Richmond's combined sewer system is the **largest in Virginia.**

Parts of the City's sewer system are over 150 years old and were designed as a CSS. In the CSS, the pipes were constructed to transport wastewater and stormwater, with the vast majority being stormwater. As a result, the CSS can become overwhelmed during wet weather conditions.

The City's CSS area covers 19 square miles and includes 25 combined sewer outfalls. During storm events, there can be overflows from these outfalls. Overflows are primarily stormwater but can contain small amounts of wastewater. The City has made significant strides in reducing the number and volume of these overflows as reflected in this report.

Since 1970, the City and the Commonwealth of Virginia have invested more than $780 million (adjusted to today's dollars) for projects to address the CSS and provide cleaner water for our community.

Improvements to the City's CSS are complicated projects that must be carefully engineered, permitted, and implemented. To date, the City's efforts have reduced the volume of Combined Sewer Overflow (CSO) entering the James River by more than 3 billion gallons annually.

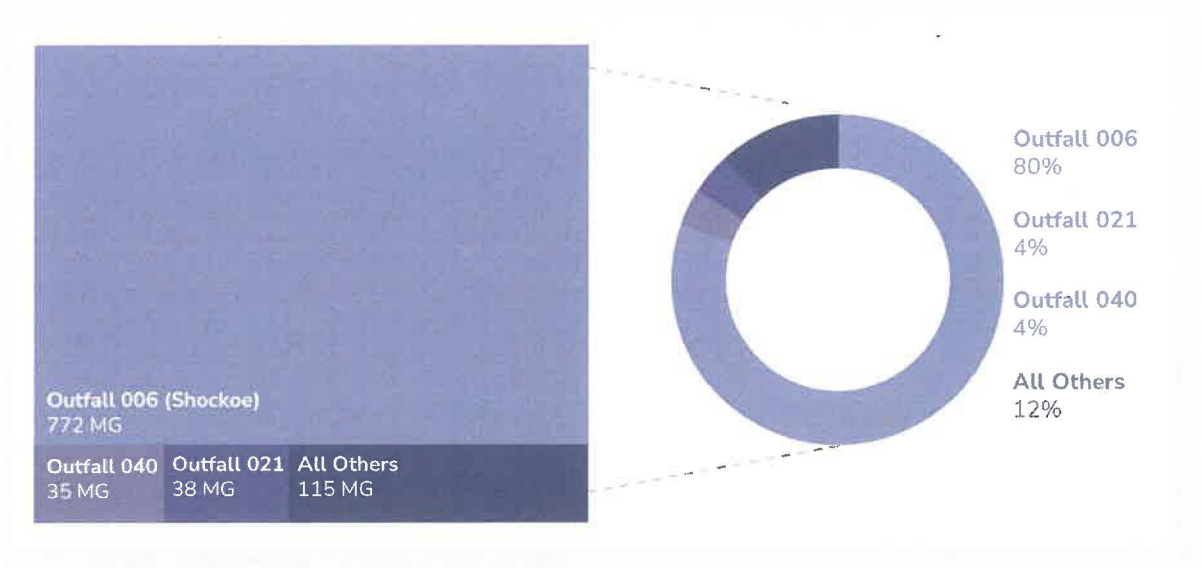
Senate Bill 1064 approved by the Virginia General Assembly in 2020 (Acts of Assembly Chapter 634) amended the City's Consent Order to require the City to undertake additional projects, identified in an Interim Plan and Final Plan to be completed by 2035. A consent order is an administrative order issued by VA DEQ with the consent of a responsible party, in this case the City. Consent orders are authorized by statute and contain specified actions that a responsible party must perform to maintain compliance with environmental requirements.

The completion of the Interim Plan projects by 2027 will further reduce approximately 182 million gallons of CSO. The bulk of the remaining CSO originates from the Shockoe outfall. Given the size of the drainage area (12.5 square miles) and its significant infrastructure, addressing it will be engineering and cost intensive. The Final Plan will address additional CSO control measures and will be submitted to VADEQ by July 1, 2024.

The City remains steadfast in its commitment to meeting the obligations established in the Consent Order. In 2022, the City Council adopted Resolution No. 2022-R025 expressing its support for prioritizing improvements to the CSS.

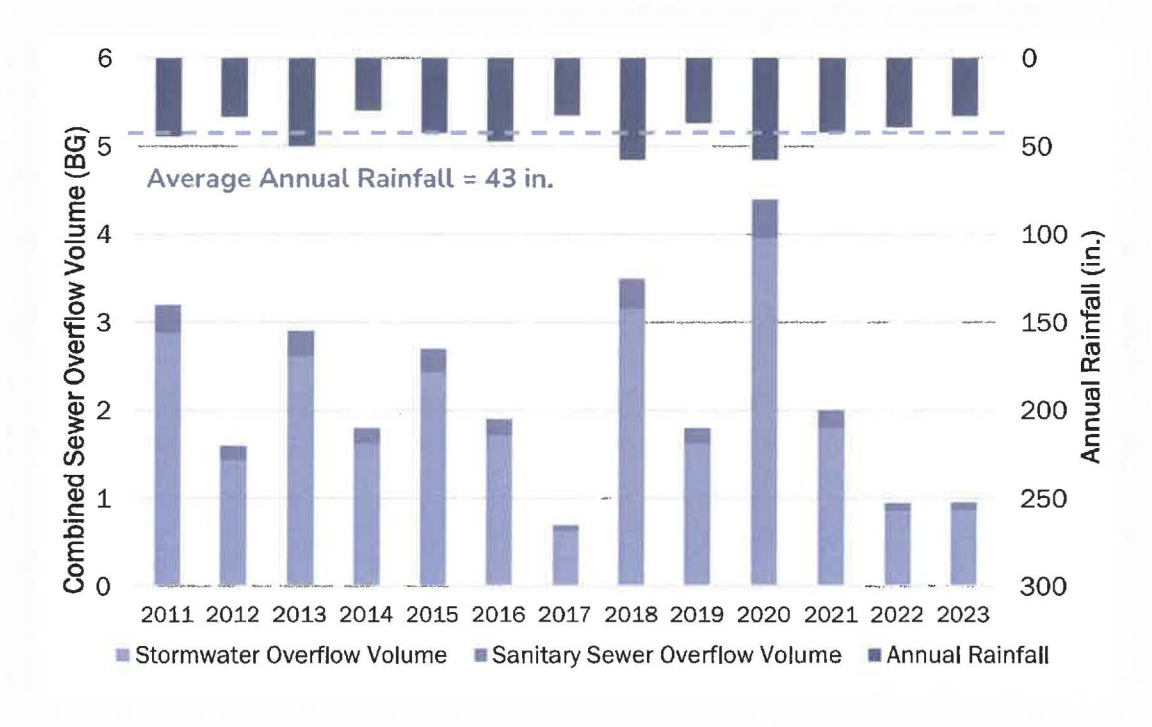
Figure 1. Project Timeline

Figure 2. 2023 YTD Combined Sewer Overflow Volume



Outfall 006 in Shockoe has accounted for approximately 80% of CSO volume in 2023 and will be the focus of the Final Plan.

Figure 3. 2011–2023 YTD Combined Sewer Overflow Compared to Annual Rainfall



More than 90% of annual CSO volume is stormwater. The rainfall in the CSS (43 inches annually on average) would flow into the James River even if the City did not have a CSS.

SECTION B: INTERIM PLAN IMPLEMENTATION STATUS

Construction of Interim Plan Project Outfall 004 is currently in progress.

The City submitted the Interim Plan by July 1, 2021, as required. It identified 10 projects with an estimated $33.3 million cost (in 2021 dollars). The City initiated construction and related activities by the July 1, 2022 deadline.

The projects will be completed on or before the July 1, 2027 completion deadline and will reduce approximately 182 million gallons of the remaining 1.9 billion gallons of annual CSO from overflowing into the James River. Additional overflow is being addressed in the Final Plan.

Interim Plan Due Date	Initiate Construction and Related Activities	Complete Construction and Related Activities
✓ July 1, 2021	✓ July 1, 2022	○ July 1, 2027

The 10 projects feature the utilization of a new real-time decision support system (RT-DSS) that will be informed by real-time system monitoring data. This system will provide the City with the ability to adjust operations during wet weather events based on current and expected system operating conditions. These adjustments will optimize the use of the existing infrastructure and facilities. This means that the City can redirect the combined sewer flows to available storage areas and shut off discharges from certain areas to better control where and when the discharges occur.

Interim Plan Project: Outfall 004
- Relocate the Regulator
- Send additional flow to the downstream sewer
- Utilize in-line storage

Overview

5.1 MG overflow volume reduction

48 fewer annual overflow events

$17.4M Bid Price

In Construction

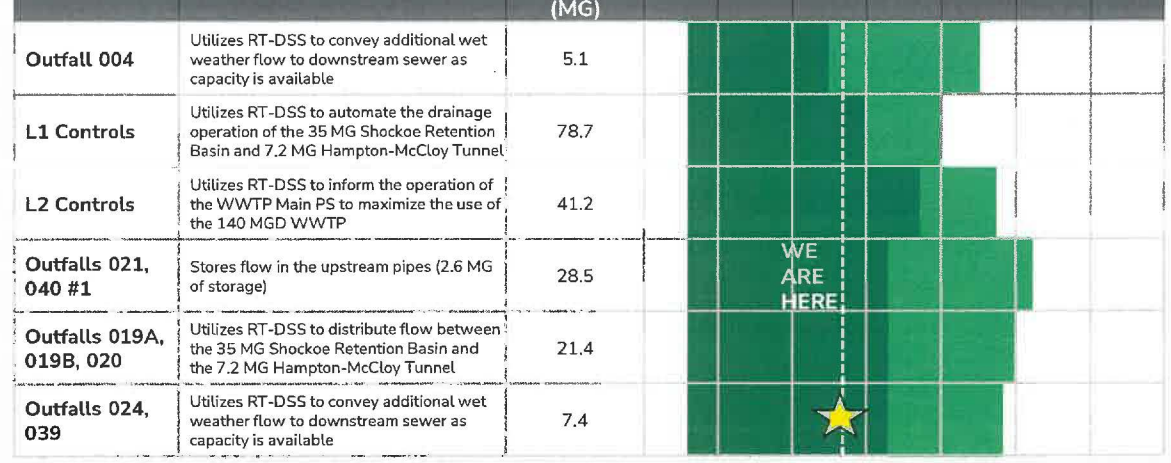
Outfall 004 Interim Plan Project (currently under construction.

Figure 4. Interim Plan Project Locations

This map illustrates the locations of the 10 Interim Plan projects.

Figure 5. Interim Plan Project Implementation Schedule

Project	Purpose	Annual Overflow Volume Reduced (MG)
Outfall 004	Utilizes RT-DSS to convey additional wet weather flow to downstream sewer as capacity is available	5.1
L1 Controls	Utilizes RT-DSS to automate the drainage operation of the 35 MG Shockoe Retention Basin and 7.2 MG Hampton-McCloy Tunnel	78.7
L2 Controls	Utilizes RT-DSS to inform the operation of the WWTP Main PS to maximize the use of the 140 MGD WWTP	41.2
Outfalls 021, 040 #1	Stores flow in the upstream pipes (2.6 MG of storage)	28.5
Outfalls 019A, 019B, 020	Utilizes RT-DSS to distribute flow between the 35 MG Shockoe Retention Basin and the 7.2 MG Hampton-McCloy Tunnel	21.4
Outfalls 024, 039	Utilizes RT-DSS to convey additional wet weather flow to downstream sewer as capacity is available	7.4



This chart provides a summary of the implementation schedule for all Interim Plan projects.

SECTION C: FINAL PLAN DEVELOPMENT STATUS

The Final Plan will identify projects to meet or exceed the performance goals established in the Consent Order.

The required Final Plan deadlines are provided below:

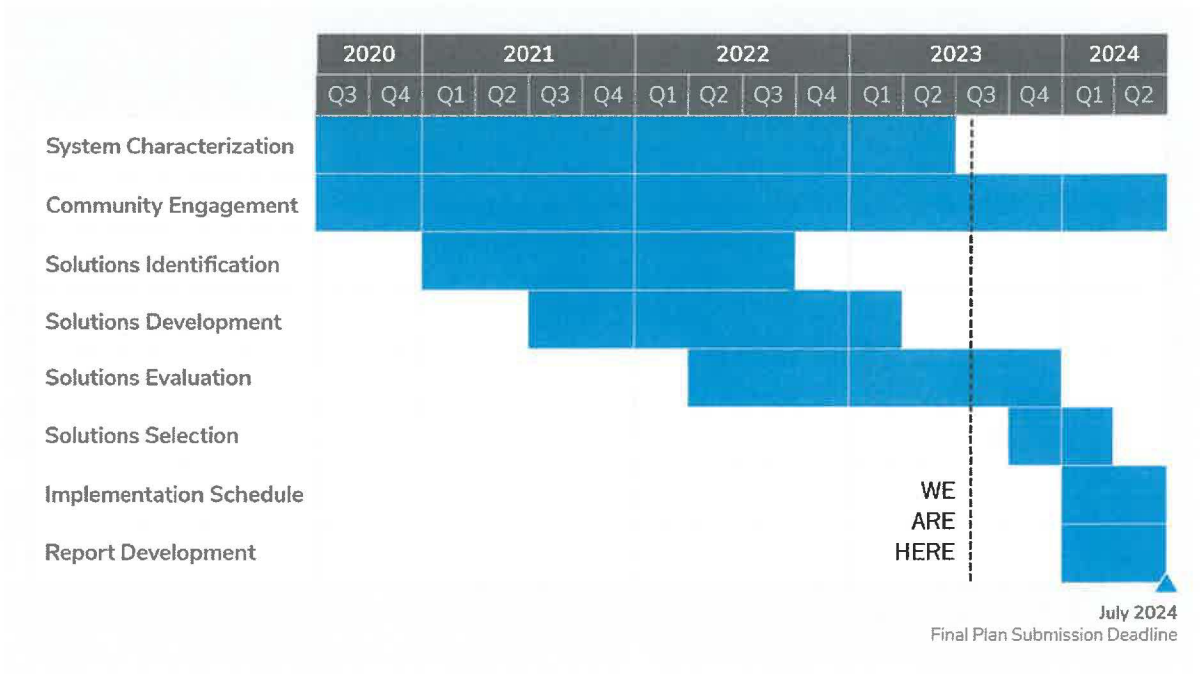
Final Plan Due Date	Initiate Construction and Related Activities	Complete Construction and Related Activities
◯ July 1, 2024	◯ July 1, 2025	◯ July 1, 2035

Since the passage of SB 1064, the City's technical experts have been developing a cost-effective plan to be submitted on or before July 1, 2024. The Final Plan will identify solutions and provide an implementation schedule. Solutions currently under consideration include large-diameter conveyance tunnels, storage facilities, and high-rate wet weather treatment facilities.

Figure 6. High-Rate Disinfection Facility Example

The Final Plan may potentially include a high-rate disinfection facility, similar to the facility shown here, which removes bacteria before it is discharged into the receiving waters.

Figure 7. Final Plan Development Timeline



This chart provides a summary of the Final Plan development schedule.

Figure 8. Final Plan Development Status

Completed | Underway | To be done

System Characterization

- Updated the City's CSS model to reflect existing conditions
- Calibrated the City's CSS model to evaluate solutions using 140 meters that were installed to collect CSS data
- Updated the City's CSS model to prepare for the calibration effort
- Selected the hydrologic evaluation period to be utilized for the Final Plan
- Calibrated the City's CSS model to use as an evaluation tool

Community Engagement

- Created a new 18-person Public Stakeholder Group to inform the development of the Final Plan
- Conducting bi-monthly meetings with DEQ to provide updates on the Final Plan development status and critical decision points
- Continuing to engage with and inform the Public Stakeholder Group and Richmonders at large

Solutions Identification

- Identified multiple solutions to meet the intent of the Final Plan requirements
- Identified locations of sensitive areas (endangered species, recreational areas, etc.) along the waterways within the City limits to be prioritized for CSS control
- Reviewed the City's master planning studies to identify potential conflicts and partnership opportunities with the identified solutions

Solutions Development

- Performed a screening analysis to identify viable solutions
  - Technical feasibility
  - Constructability
  - Operations & maintenance impacts
  - Regulatory impacts
  - Land use permitting
  - Environmental impacts
  - Community impacts
- Developed initial design criteria for the viable solutions
- Developed initial cost estimates for the viable solutions

Solutions Evaluation

- [x] Conducted a preliminary level of control analysis to better understand the relationship between the estimated program cost and performance
- [ ] Developing project scoring criteria in coordination with the Public Stakeholder Group
- [ ] Utilizing the City's calibrated model for the following:
  - Evaluate the performance of the solutions
  - Update the level of control analysis
  - Perform a climate change sensitivity analysis for the solutions
- [ ] Conducting water quality modeling to evaluate the water quality improvements

Solutions Selection

- [ ] Comparing the solutions to the remaining Special Order projects
- [ ] Selecting the projects to be implemented in the Final Plan

Implementation Schedule

- [ ] Conducting a financial capability and affordability assessment to evaluate the City's options for financing the Final Plan projects
- [ ] Developing an implementation schedule for the selected projects
- [ ] Develop an Operation and Maintenance Plan for the selected projects
- [ ] Develop a Post Construction Monitoring Plan for the selected projects

Report Development

- [ ] Developing the Final Plan to be submitted

SECTION D: OTHER ONGOING CSS CLEAN WATER PROJECTS

In addition to the Interim and Final Plans, the City is implementing several other projects not required by the Consent Order to improve water quality.

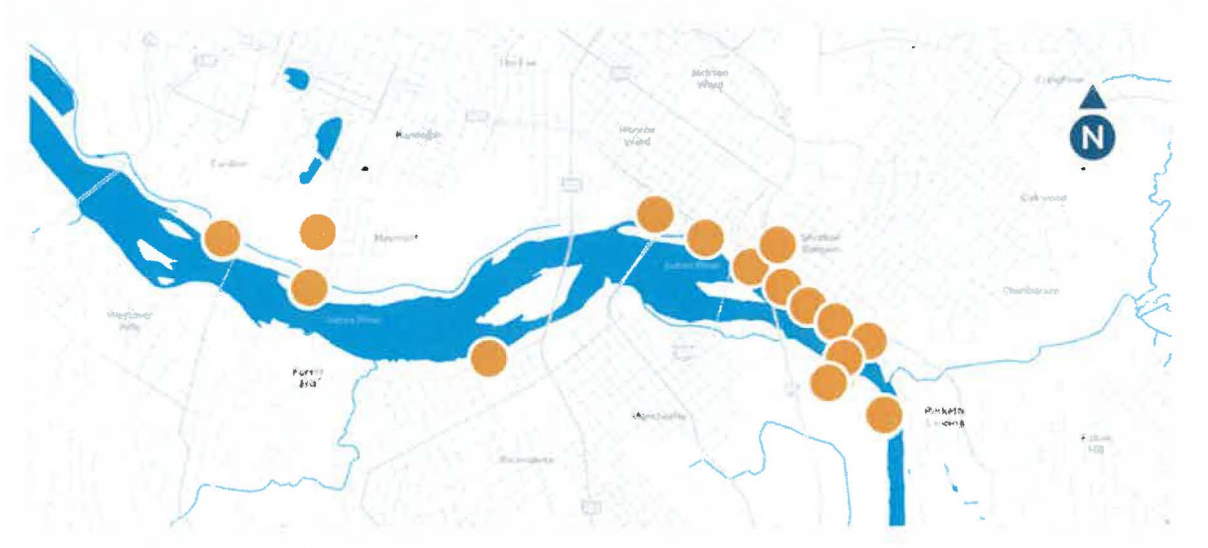
Shockoe Facility Projects: Several projects are being completed in or around the Shockoe Facilities to improve the performance of the system.

Wastewater Treatment Plant (WWTP) Improvements: With the recent upgrades in 2021, the WWTP is now capable of treating up to 140 million gallons per day (MGD) in wet weather. The performance of the City's WWTP is critical to the performance of the CSS. The City is in the process of conducting significant upgrades to improve WWTP operations and the reliability of the 140 MGD treatment during wet weather.

1.6 billion gallons has been treated at the new Wet Weather Disinfection Facility to date

Regulator and Outfall Improvements: The City's CSS contains 25 outfalls and 40 regulator structures. Operations and maintenance (O&M) activities and capital improvement projects are ongoing to maintain and improve the functionality of these facilities.

Figure 9. Locations of Other Ongoing CSS Clean Water Projects



This map shows the locations of the ongoing CSS projects, which are outside the scope of the Interim and Final Plans.

Figure 10. Implementation Status for the Other Ongoing CSS Clean Water Projects

Project	Estimated Cost (in today's dollars)	Purpose	Estimated Completion Date
Shockoe 96-Inch Sewer and Twin 66-Inch Siphon Cleanings	$3M	Cleaning critical interceptors to reinstate the conveyance capacity of the sewers	Spring 2024
WWTP Screening and Grit Facility	$40M	Installation of a new Screening and Grit Facility	Summer 2024
Regulator Improvements	$2M	Upgrading equipment in seven regulator structures	Spring 2025
Shockoe Retention Basin and Hampton-McCloy Tunnel Cleaning	$5M	Cleaning critical storage facilities to reinstate the storage capacity	Summer 2025
Shockoe Retention Basin Roof Repairs	$2M	Rehabilitation of the Shockoe Retention Basin roof	Spring 2026
Shockoe Screening and Crest Gate Improvements	$28M	Upgrade the screening equipment in the Shockoe West Diversion Structure and replace the two crest gates (86-ft and 54-ft long)	Fall 2026
Outfall 006 Regulator Improvements	$1M	Upgrade Outfall 006 to prevent tidal intrusion from the James River into the CSS	Fall 2026
Hampton Pump Station (PS) Improvements	$1M	Upgrade the electrical and control system at the PS	Fall 2026
Dock Street PS Improvements	$1M	Upgrade the electrical and control system at the PS	Fall 2026
WWTP Main PS Improvements	$63M	Rehabilitation of the existing WWTP Main Pump Station	Fall 2027

The purpose, estimated cost and completion date for these projects are summarized above.

SECTION E: COMMUNITY ENGAGEMENT AND OUTREACH

The City continues to expand its engagement with stakeholders and residents.

Camp DPU participants visit the Shockoe Retention Basin, 35 MG storage facility, Summer 2023.

Throughout the process of addressing its CSS, the City has educated, informed, and sought the input and feedback of stakeholders and the public. This outreach builds off years of communications and campaigns undertaken by the City prior to the General Assembly's approval of SB 1064. DPU's Citizen's Academy programming and facility tours supplement the City's very active social media outreach. DPU continues close collaboration with DEQ and since 2020, the City has expanded its efforts to increase stakeholder involvement in the development of the Interim and Final Plans.

Final Plan Public Stakeholder Group (Founded 2022)

In 2022, the City formed a new Public Stakeholder Group (PSG) to assist in the development of the Final Plan. This 18-person group includes two members from each of the City's nine Council districts. As ratepayers who deserve the highest-quality service, the residents of the City are critical stakeholders in the development of the Final Plan. The members were selected based on recommendations from City Council members, their liaisons, and neighborhood associations.

The PSG continues to meet with the City's Project Team on a bi-monthly basis throughout the development of the Final Plan and will:

- Review and monitor the development of the Final Plan
- Provide input and insight from their communities
- Share progress with their communities

PSG members tour the Gillies Creek CSO Outfalls on August 31, 2023.

Nine meetings have been held to date with the Public Stakeholder Group:

Meeting #1 (Hybrid on Thursday, May 5, 2022)
- Introductions
- Background on the Department of Public Utilities
- Introduction to the CSS
- Introduction to SB 1064, its requirements, and the Final Plan's purpose
- Overview of the PSG's role in the development of the Final Plan

Meeting #2 (Fully Virtual on Thursday, July 28, 2022)
- Communally creating ground rules for the PSG
- Overview of the City's CSS
- Review of the Final Plan's purpose
- Overview of the Final Plan's requirements

Meeting #3 (In-Person Facilities Tour on Tuesday, September 20, 2022)
- Site visit to the City's Wastewater Treatment Plant
- Tour of Shockoe Retention Basin

Meeting #4 (Fully Virtual on Thursday, September 29, 2022)
- Review of the City's CSS
- Overview of methods and technologies for CSS control
- Solutions in other CSS communities (Cook County and the District of Columbia)
- Overview of how solutions will be evaluated

Meeting #5 (Fully Virtual on Thursday, February 23, 2023)
- Review of green infrastructure solutions and their usefulness in bacteria removal
- Identification of potential solutions in the Gillies Creek, North Side and Hampton-McCloy sewersheds

Meeting #6 (Fully Virtual on Thursday, April 27, 2023)
- Identification of potential solutions in the Southside, Manchester, and Shockoe sewersheds

Meeting #7 (Fully Virtual on Thursday, June 29, 2023)
- Review of potential solutions
- Discussion of key evaluation items

Meeting #8 (Fully Virtual on Thursday, August 24, 2023)
- Review of Final Plan regulatory requirements
- Review of the performance, cost, and cost-effectiveness metrics for each potential solution

Meeting #9 (Fully Virtual on Thursday, October 19, 2023)
- Review of the qualitative scores for each potential solution
- Review of the ranking for each potential solution based on performance, cost and qualitative metrics

RVAH2O Technical Stakeholder Group (Founded 2014)

The Public Stakeholder Group complements the pre-existing RVAH2O Technical Stakeholder Group. RVAH2O consists of dozens of representatives from the community, including environmental groups and other stakeholders. This group was formed in the fall of 2014. While the primary focus of RVAH2O is involvement in the City's implementation of its integrated permit, the group has also provided feedback on the Interim and Final Plans. The Interim Plan projects, for instance, were reviewed with RVAH2O throughout their development. During this group's biannual meetings, they continue to be provided with progress reports on project implementation and continue to offer valuable feedback and insights.

The RVAH2O Technical Stakeholder Group consists of government, community, nonprofit, and private sector partners.

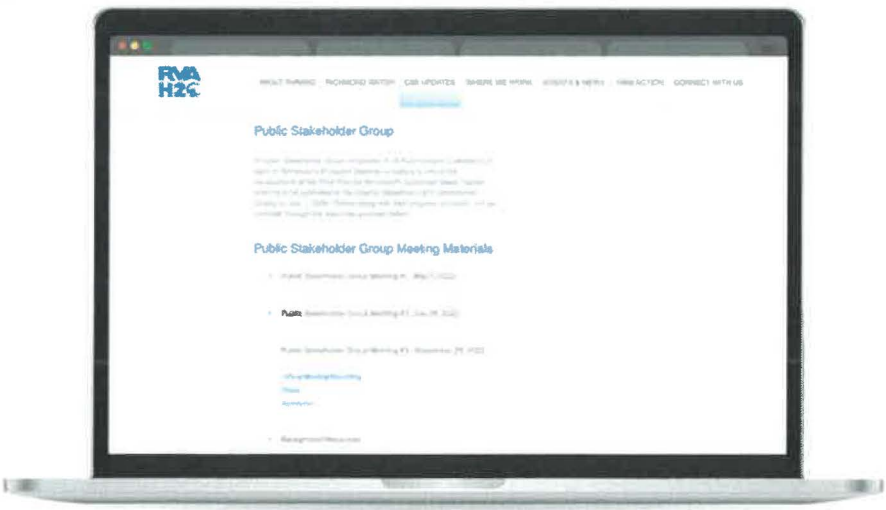
Coordinating with DEQ

Throughout the development of the Interim Plan, the City met with DEQ monthly to include the agency in decision-making and allow for full involvement and inclusion in the process. During the Final Plan's development, the City is continuing to meet with DEQ. These ongoing bimonthly meetings allow DEQ to track the progress and the process of the Final Plan's development and provide the City with the opportunity to obtain important feedback from the agency, such as the Final Plan's purpose, modeling criteria, and solutions.

The City has met regularly with DEQ 27 times to discuss the Interim and Final Plan

Online Engagement

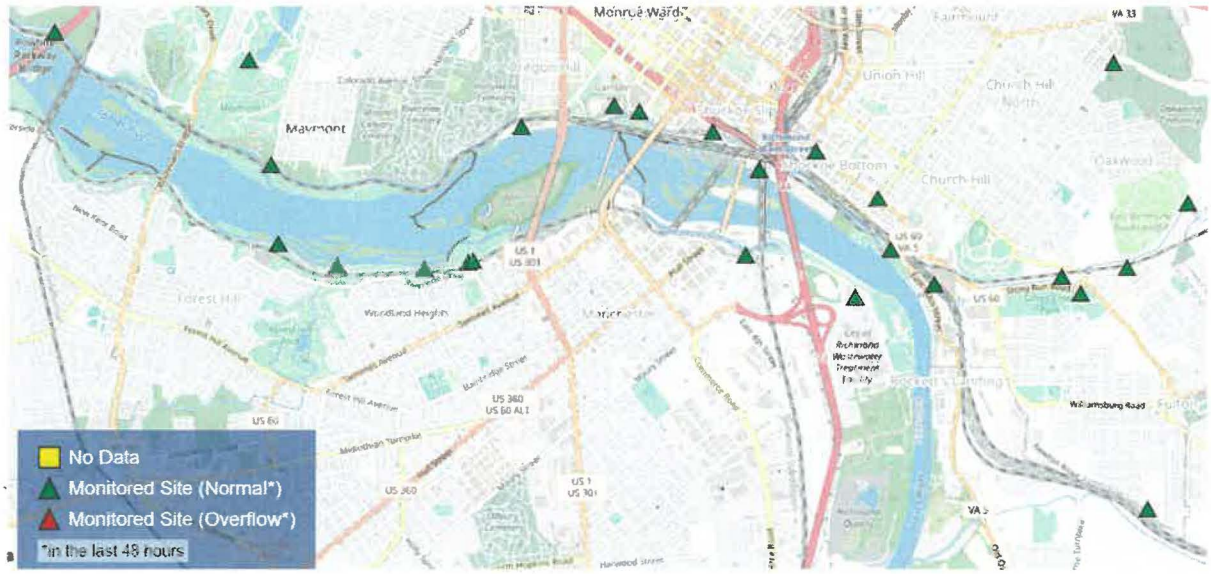
The Department of Public Utilities has worked diligently to continually enhance its digital presence. Background information on the CSS, resources, reports, and presentations are all maintained on the RVAH2O.org website. This includes the latest information on the City's CSS and improvements made to date, Consent Order requirements, the Interim Plan, the Final Plan's development, and content created and shared with the PSG. PSG meeting slides, resources, and recordings are made available on the website for the PSG members and the public alike. Similarly, RVAH2O meeting slides and recordings are also posted to the site. The website is also home to other resources including an explanatory Story Map that helps newcomers understand the CSS.



The RVAH2O.org website offers information regarding the ongoing improvement of the City's CSS.

Additionally, a real-time notification map provides the public with access to monitor recent overflow activity at the CSS outfalls. This map, shown in Figure 11, offers transparency to Richmonders and other James River users and allows the public to stay informed of overflow activity throughout the City. Though users are empowered to visit the map directly at their discretion, reminders are often shared on the RVAH2O social media channels during and after rain events.

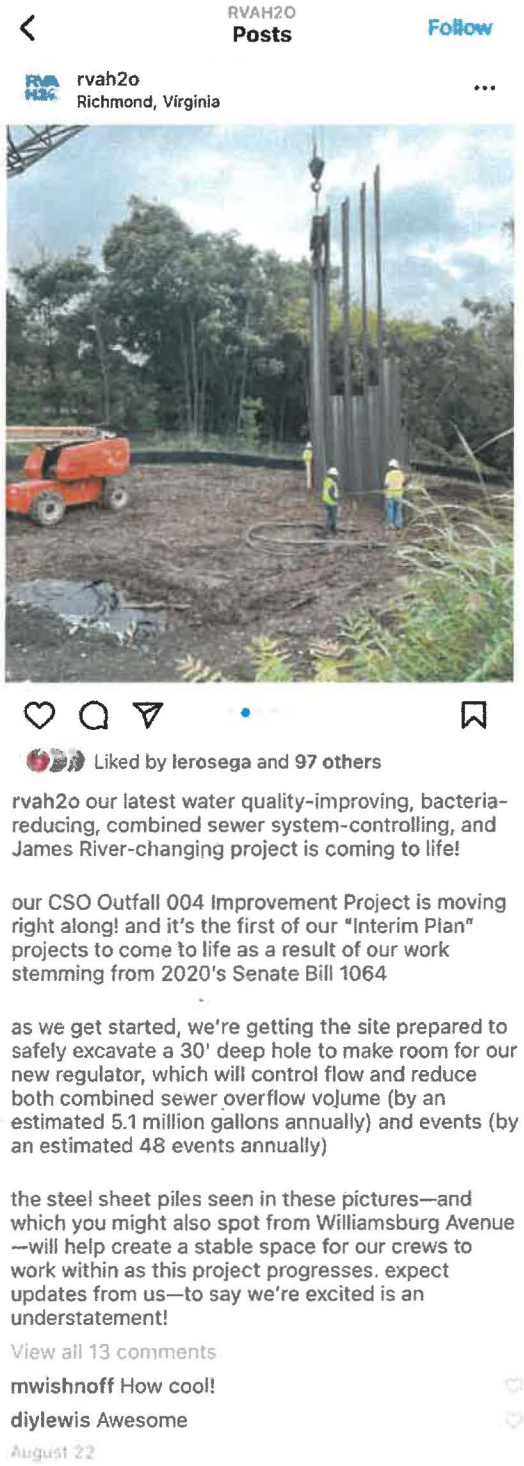
Figure 11. A Screenshot of the City's Publicly Available, Real-Time CSO Notification Map



Real-time notification map that allows the public to monitor recent CSO activity in the City.

The award-winning RVAH2O social media accounts – Twitter (X), Instagram, and Facebook – serve as additional avenues for two-way communication between City residents and DPU. These active accounts provide updates on ongoing efforts, operations, and maintenance activities, and the Interim and Final Plans alongside basic, general CSS education. DPU has found that sharing online through these platforms keeps followers engaged and the audience growing, speaking to the efficacy of consistent, transparent, and clear information.

RVAH2O Instagram Post (8/22/23) showing historical construction photo of the SRB



RVAH2O Instagram Post (8/22/23) updating the public on the construction progress for the Outfall 004 Interim Plan Projects

Chesapeake Bay Commission and the Wet Weather Partnership

The Chesapeake Bay Commission, which serves to advance and coordinate policy and action to restore the Chesapeake Bay watershed, will be hosting their next quarterly meeting in the City of Richmond later this month (November 9th and November 10th). The City will be updating the Commission on our efforts to improve future water quality in the James River.

The Wet Weather Partnership, which "[promotes] cooperation among federal, state, and local governments in the regulatory development process and [works] with key national stakeholders", will host its annual Workshop focused on CSS control, planning, policy, and funding in the City of Richmond (April 24th – April 26th 2024). The City will be showcasing the innovative CSS improvements to improve water quality in the James River.

The City is looking forward to hosting both of these gatherings in Richmond in the months ahead. DPU is excited to share our dedicated progress with the Chesapeake Bay Commission and the 2024 Wet Weather Partnership Conference.

SECTION F: COSTS AND FUNDING SOURCES

Other CSS Clean Water Project Projects

As detailed in Section D, other projects (excluding the Interim and Final Plan projects) to maintain and improve the performance of the existing CSS will be costly for ratepayers. Since 2020, the City has invested $40 million in these projects and is projected to spend an additional $140 million over the next four years. This is an important context to understand the City's requests and spending demands for the Interim and Final Plan projects.

Interim and Final Plan Spending

The current Interim and Final Plan cost estimate is expected to range between $700 million and $1.3 billion (escalated to the mid-point of construction in 2033), depending on which projects are selected to be implemented in the Final Plan.

This range will be updated as the City's Final Plan is further developed and completed (in 2024). The total spending to date for the Interim and Final Plans is approximately $15 million.

The City greatly appreciates the General Assembly's American Rescue Plan Act (ARPA) fund appropriations of $50 million in 2021 and $100 million in 2022. The City is working closely with DEQ staff to fulfill the administrative requirements to execute these grant agreements in accordance with state and federal guidelines.

The City will use $150 million in City funds to meet the 2026 Federal ARPA deadline:

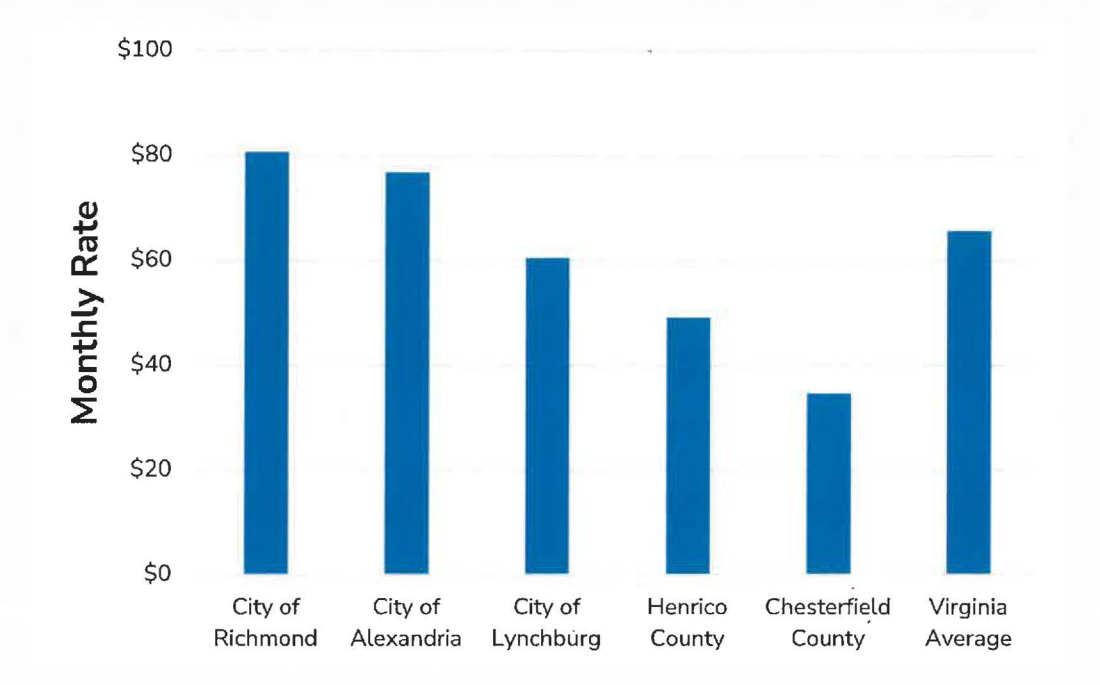
- The 2021 $50 million ARPA appropriation match
- The 2022 $100 million ARPA appropriation match

While this ARPA funding will cover most of the Interim Plan projects and other beneficial CSS improvements, the Federal deadline of December 2026 to complete ARPA project reimbursements precludes this funding source from being of any benefit toward our Final Plan program funding.

In addition to saddling the City's ratepayers with this additional $150 million for Interim and Final Plan projects, the City will still need hundreds of million dollars in State or Federal grant funding between now and 2030 in order to advance these major Final Plan infrastructure projects from design to construction.

The City's ratepayers already pay higher rates than neighboring counties and other comparable CSS communities in the Commonwealth, as shown in Figure 12.

Figure 12. Utility Rate Comparison



Comparison of monthly wastewater rates based on approximately 5,200 gallons of monthly water usage

The City was disappointed that $100 million was removed from the 2023 Special Session I Budget. The needs in the short term for funding in the caboose and biennium budgets are important to comply with regulatory timeframes as provided for in the Consent Order and the Actions of Assembly Chapter 634.

Consent Order Reporting Requirements

The Consent Order requires the City to submit this progress report and to provide certain financial information. The City applied the following level and sources of funding to the CSS over the past five fiscal years.

Figure 13. CSS Funding – Last Five Years

Source	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	5-Year Totals
Virginia Revolving Loan Fund	$0	$0	$886,551	$3,867,832	$12,669,050	$17,423,433
Grant Receipts	$10,008,717	$10,351,801	$0	$1,271,149	$983,193	$22,614,860
Wastewater Revenue Bonds/Operating Cash	$4,224,198	$8,878,249	$2,999,262	$8,291,953	$3,814,193	$14,018,230
Total CSS Expenditures	$14,232,915	$1,473,552	$3,885,813	$13,430,934	$17,466,436	$54,056,522

The City will need financial grant funding support of approximately $400 million (to be updated once the Final Plan is complete in July 2024) over the next five years to avoid having to request extensions to the July 1, 2035, Final Plan construction completion timeline.

As required by the Consent Order, the City requests significant recurring grant appropriations in the General Assembly's future budget appropriation bills sufficient to stay on schedule, while avoiding unfavorable financial consequences.

The needs in the short term for funding in the caboose and biennium budgets are essential. As a result the City is requesting funding as follows:

- FY 2024 caboose budget: $100,000,000
- FY 2025: $100,000,000
- FY 2026: $100,000,000

Other Funding Sources

In addition to state grant funds, the City identified and is evaluating the potential use of the following federal and state funding programs (including loan forgiveness options) as it continues to develop the Final Plan:

- Clean Water State Revolving Loan Fund (CWSRLF)
- Water Infrastructure Finance and Innovation Act (WIFIA) loans
- Justice40 Initiative
- Build Resilient Infrastructure and Communities - Grants

The City of Richmond Department of Public Utilities appreciates the opportunity to provide this update on the vital work underway and the partnership that DEQ has demonstrated in this process. Should you have any questions or comments, please contact me directly at 804.646.5205 or april.bingham@rva.gov.

Sincerely,

April N. Bingham, Director

Copy:

Levar M. Stoney, Mayor, City of Richmond

Lincoln Saunders, Chief Administrative Officer, City of Richmond

Michael J. Jones, Council President and City Councilmember, 9th Voter District

Reva M. Trammell, City Councilmember, 8th Voter District

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Robert C. Steidel, Deputy Chief Administrative Officer, Operations, City of Richmond

Emily Messer, Assistant City Attorney, City of Richmond

Scott Morris, Director of Water, Virginia DEQ

Melanie Davenport, Director of Regulatory Affairs & Outreach, Virginia DEQ

Jerome Brooks, Director, Piedmont Regional Office, Virginia DEQ

Alex Samms, Chief Deputy, Virginia DEQ

Meghan Mayfield, Director of Water Permitting, Virginia DEQ

November 27, 2023

The Honorable Michael Rolband, Director
Virginia Department of Environmental Quality (VADEQ)
1111 East Main Street, Suite 1400
Richmond, VA 23219

Subject: City of Richmond 2023 Combined Sewer System General Assembly Report

******ADDENDUM******

Thank you again for taking the time to meet with the City of Richmond Department of Public Utilities on November 6, 2023 to discuss our planning for SB 1064 (Acts of Assembly Chapter 634). The City remains appreciative of the partnership with DEQ and looks forward to submitting the Final Plan for the CSS Program by July 1, 2024. This letter provides additional context to the report submitted on November 1, 2023, including specific answers to questions posed during our meeting.

The estimated total amount of funding needed to get from where we are today to completion of the Final Plan, as provided for in the Acts of Assembly Chapter 634, is $650 million. It is important to note that, like with other large-scale capital projects, spending begins gradually and then ramps up exponentially. As DEQ is aware, Richmond will need the majority of the $650 million in hand before it can bid and sign construction contracts. That process is expected to begin in FY 2029. Therefore, Richmond will need on the order of magnitude of $500 million by that date.

As the November 2023 report showed, Richmond has begun implementing the Interim Plan and has done considerable work developing a proposal for the Final Plan. That work has led to a cost avoidance of over $600 million, as the original estimate was $1.3B and has now been reduced to $650M through the evaluation of alternatives and innovative engineering solutions. This change will be detailed in the Final Plan submission and serves as confirmation that Richmond remains committed to finding the most efficient and effective means possible of meeting the requirements of SB 1064.

It is extremely important to note that Richmond cannot do this alone. While Richmond remains grateful for the ARPA funding provided by the Commonwealth, the deadlines associated with ARPA do not make it feasible for that funding to be used toward the construction of projects in the Final Plan. With a poverty rate nearly double that of the

Commonwealth's[1] and a utility rate that is among the highest in Virginia, a lack of continued grant funding from the Commonwealth will put an untenably high burden on Richmond's residents. In line with 2020 SB 1064's mandate that DEQ assist Richmond in "identifying available sources of funding and financing" for the work, the City seeks your support in urging the Governor and the General Assembly to plan for the grant funding needed for Richmond's CSO program. Best practices for budgeting for a project of this scope dictate setting aside funding for many years, ensuring the project is not derailed by future political disinterest in clean water improvements, recessions, or other unexpected events.

We thank you for your continued support as we all work toward the cleanest James River possible. Answers to questions that were raised during our November 6 meeting are provided here:

1. **What is the amount of current dollars in the Virginia ARPA CSO fund?**
    a. The breakdown is as follows:
        i. 2021 ARPA Funding* $50M, combined with $50M from the City, to be spent on CSS improvements includes the following: Shockoe Trask Raking and Crest Gates Improvements project currently under construction ($34M), Wastewater Treatment Plant Main Pumping Station Improvements currently in procurement for design engineering services ($64M), and Shockoe Retention Facility Roof Improvements ($2M). The approximate total cost of these projects = $100M.
        ii. 2022 ARPA Funding* $100M will be spent on Interim Plan projects ($40M); other CSS improvements ($22M); and two Final Plan projects ($42M). The City may need to identify additional funding above ARPA if construction costs come in higher than expected. The approximate total cost of these projects = $104M.

    **Note that ARPA funding must be spent by December 2026.*

2. **What has been spent to date?**
    a. The City of Richmond has been working to address the impacts of the combined sewer system since the 1970s. Over the past 50+ years the City has spent over $350M on its CSO Program, which would equate to roughly $780M in today's dollars. City ratepayers have shouldered almost 70% of this cost resulting in sewer bills that are among the highest in Virginia despite levels of poverty nearly double the State-wide average

[1] 19.8% of Richmonders live in poverty, as compared to 10.6% of Virginians.

and a Median Household Income (MHI) roughly 30% below the State average.

b. Since March 2020, the City has obligated over $50M toward the design and construction of ARPA funded projects. The City has expended about $6M on development of the Interim and Final Plans and has begun incurring significant construction cost spending on Interim Plan and other CSO related projects.

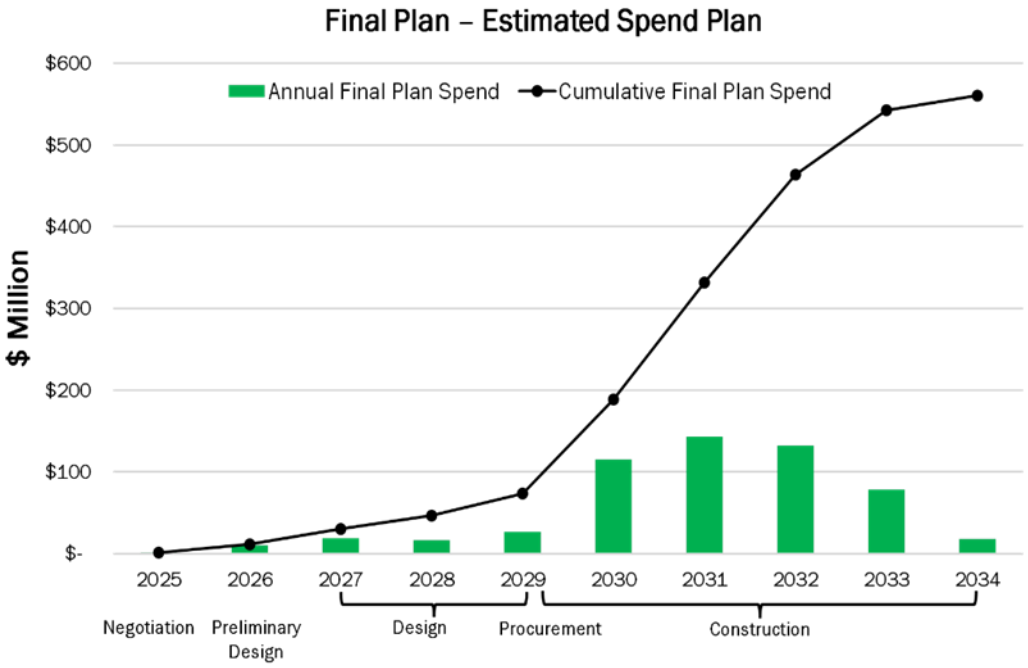
3. What is the $100M in caboose budget going to? And what is the $100M in each year of biennial budget going to?

a. The US Treasury Department's ARPA Final Rule provides State governments with wide latitude to identify investments in water and sewer infrastructure that are of the highest priority for their own communities. This ARPA money ($150 M) previously allocated to Richmond by the 2021 and 2022 sessions of the Virginia General Assembly, along with a $50M City match, is being utilized for multiple CSO projects that were either already in design or that could be designed and constructed by the December 2026 deadline imposed by the ARPA Final Rule. Interim Plan projects and two smaller Final Plan projects are also being funded from ARPA.

As described above, the City planned for all of the $200M that has been previously appropriated to Richmond for CSO work. Therefore, in FY25 and FY26, the City will need additionally funding for design, geotechnical investigations, permitting, and public engagement, as well as to build the technical expertise and staffing needed to accomplish a project of this scope. As described above and below, the scope of this work is relatively small in comparison to the total cost of the project; but regular investments represent the most realistic funding plan to reach the $500M needed by FY 2029.

b. The ARPA funding provided by the Commonwealth is being fully committed to projects in the Interim Plan and two Final Plan projects. However, additional funding is needed for the larger CSO projects that will be included in the Final Plan due to be submitted to DEQ by July 2024. These large CSO Final Plan projects will take several years to design and obtain the necessary construction permits. In order to meet the accelerated 2035 deadline for completion of construction, several large projects will need to be constructed simultaneously which will drive the major construction spending peak between FY 2029 and 2034 as shown in the graph below.

To keep this program on track to meet the ambitious 2035 deadline, the City will need to have secured grant funding for a substantial portion of the design and construction costs by FY 2029 to back the large dollar construction contracts the City will need to execute beginning in FY 2029 to begin construction.



c. As previously communicated, the City's Wastewater Utility rate payers cannot bear the brunt of this financial burden. Taking a just-in-time, wait and hope approach to obtaining the hundreds of millions of dollars in grant funding that is needed by 2029 runs the risk of not having the necessary funding, leaving the City in a position to defer construction of the projects and jeopardizing the money put into planning and design. The City requests that the Commonwealth consider a plan of regular, more feasible allocations of CSO grant funding needed over the course of the next three State biennial budgets covering fiscal years 2025-2028. While there are several timelines the Commonwealth could adopt to provide grant funding over the next several years, one of many possible grant funding scenarios could look like the following:

i. FY24 caboose $100 million
ii. FY25 $100 million
iii. FY26 $100 million
iv. FY27 $100 million
v. FY28 $100 million

d. It is critical that the City have substantial advance grant funding guaranteed to begin making the large contractual obligations for construction activities in the FY 2029 timeframe or face impacts to the 2035 completion schedule.
e. The City will continue to seek grant funding from other sources which include federal congressional directed spending, FEMA BRIC grant program and any other potentially applicable new federal funding programs.

The City of Richmond is requesting CSO construction grant funding in the FY 24 caboose budget and future budgets beginning with FY25 through program completion, in order to keep the project on schedule and avoid unaffordable rate increases for Richmond residents.

4. **What will be the effect on the City's bond rating if the City must borrow all of the necessary funds to complete the project?**

   Richmond's Public Utilities has earned the second highest rating of Aa1 by Moody's and AA by S&P and Fitch on its utility revenue bonds, which are separate ratings from the City's general obligation bonds. Based upon the most recent rating agency reports the City's Utility system's bond ratings would most certainly be downgraded and, as a result, all City Utility customers (including Wastewater, Drinking Water, Natural Gas and possibly Stormwater) would pay even higher rates due to the increased annual debt service. Wastewater customers would have the most expensive monthly bills in the Commonwealth by significant measures. Further, these user rate increases could severely damage the City's competitiveness in the area of business retention and development, and would directly increase costs for state agencies located in Richmond. The ramifications of these rate increases would be felt for many years and could be a multiple of the direct increased expense in debt service for Utility customers. The ripple effect of these new user rates could impact the entire Central Virginia region's competitiveness and long-term fiscal stability/sustainability. Attached is an updated financial analysis from Raftelis Financial consultants.

5. **What will be the effect on utility rates if the plan is funded solely by ratepayers**?

   Richmond residents already pay the highest sewer bills in the Commonwealth as a percentage of MHI. Raftelis, the City's Utility System's rate consultant, utilized the City Utility System's rate and financial planning model to see what impact a potential $750 million (assuming $300 million below market rate loans) and a $1.15 billion increase in debt might have on rate payers. Their analysis shows

that Wastewater rates would have to increase almost 160% under the $750 million borrowing scenario and around 220% under the $1.15 billion borrowing scenario during the next time frame required to comply (2035). This means customer rates would more than double and triple from today's already burdensome levels, respectively. Please see the attached financial analysis from Raftelis Financial consultants.

In conclusion, the grant funding request for an additional $500 Million is necessary to stay on schedule to meet the 2035 deadline for the program. Any delays, at any step within the process will push program completion beyond the General Assembly's Act 634 due date. The City's Wastewater Utility ratepayers cannot fund this project alone. Without substantial grant support from the Commonwealth the deadline for completing this project will have to be re-evaluated and likely extended beyond 2035.

Sincerely,

April N. Bingham

April N. Bingham, Director

Copy:

Levar M. Stoney, Mayor, City of Richmond
Lincoln Saunders, Chief Administrative Officer, City of Richmond
Michael J. Jones, Council President and City Councilmember, 9th Voter District
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Jerome Brooks, Director, Piedmont Regional Office, Virginia DEQ

DAVENPORT & COMPANY

Public Finance Department

One James Center
901 East Cary Street
Suite 1100
Richmond, Virginia 23219
804-697-2900

MEMORANDUM

To	John 'Billy' Vaughan – City of Richmond Utilities - Deputy Department Director, Senior
From	David P. Rose, Senior Vice President and Manager of Public Finance Courtney E. Rogers, Senior Vice President
Date	November 9, 2023
Subject	Richmond Utilities – Consequences of a Potential Substantial Increase in Debt Issuance for the CSO Program

Overview

Davenport & Company LLC ("Davenport"), in our capacity as Financial Advisor to the City of Richmond, has been asked to weigh in on the potential rating and bond market implications that a substantially increased issuance of debt for the Combined Sewerage Outflow (CSO) Separation Program might have on the City's Utility System (the "City"). We understand that, in order to comply with the General Assembly enacted Senate Bill 1064, upwards of $1.3 billion would be needed for the City of Richmond to develop and execute interim and final plans to reduce overflow discharge into the James River by 2035. We further understand that grants could range from $150 million to as much as $350 million to help defray, in part, the increase in the City's funding obligations. If that were the case, the City would have to borrow between $750 million and $1.15 billion over the next seven to twelve or so years. While the rating agencies are aware of the capital need, this amount of debt that is being asked to be borrowed by the City for this project is over and above the expected issuance amounts that have been reported to the rating agencies, as part of the City's already planned multi-year Capital Improvement Program ("CIP") for the Utility System.

The City's Utility System is a combined revenue credit, which includes the Water, Wastewater and Gas Enterprise Funds. As of the last bond rating in August of 2023, the Utility System enjoys ratings of Aa1 by Moody's Investors Service and AA by both S&P Global and Fitch Ratings. Please note, these ratings are considered to be "very strong" investment grade credits – one level below "AAA", the highest possible credit ratings for the Moody's rating.

At the time of the last bond rating, the Utility System's multi-year CIP plan was shared with the rating agencies, which included City funding for the CSO program. A program which state officials have agreed with. Each of the three rating agencies were comfortable with the City's CIP plan. However, all commented that a material increase in future debt beyond the August 2023 plan would be a potential cause for a rating downgrade.

1. From Moody's Investors Service's Press Release dated August 15, 2023:

As previously mentioned, the System enjoys a Aa1 rating from Moody's Investors Service. The System's rating was upgraded to Aa1 in connection with the issuance of the System's 2020 Bonds, and the Aa1 rating was affirmed in August 2023 in connection with the issuance of the 2023C Bonds. An excerpt from the August 15, 2023 Press Release has been provided below:

"RATING OUTLOOK

The stable outlook reflects the likelihood that the system's financial position and debt service coverage will remain healthy, despite substantial capital needs and a higher-than-average debt burden, driven by management's commitment to consistent annual rate increases as well as long-range financial planning.

FACTORS THAT COULD LEAD TO AN UPGRADE OF THE RATING

- *Sustained reduction of the system's outstanding debt*
- *Significant improvement in debt service coverage and liquidity*
- *Material service area expansion and diversification coupled with improved resident income levels*

FACTORS THAT COULD LEAD TO A DOWNGRADE OF THE RATING

- *Increased debt profile*
- *Inability or unwillingness to implement timely rate increases*
- *Reduction in debt service coverage or liquidity*
- *Substantial service area contraction or declines in resident wealth"*

Additionally, in their Credit Opinion dated August 16, 2023, Moody's Investor Service sited "*Significant capital needs related to combined sewer overflows"* as one of two Credit Challenges for the System.

2. From S&P Global's Report dated August 16, 2023:

S&P Global affirmed the System's AA rating in connection with the issuance of the 2023C Bonds. Excerpts from their August 16, 2023 Report have been provided below:

"Our rating reflects Richmond Department of Public Utilities' (DPU) strong financial position achieved through sound financial and operational management policies and practices. Offsetting these strengths are significant challenges stemming from capital needs of $1.3 billion to address combined sewer outflows (CSO) by 2035, against the backdrop of weaker service area incomes and rising receivables, as well as volatile commodity prices."

2. From S&P Global's Report dated August 16, 2023 (cont.):

The S&P Global report also provided potential rating downgrade and upgrade scenarios:

"Downside scenario

Should coverage become pressured by increasing uncollectible accounts or an inability to raise rates as expected due to affordability concerns, we could lower the rating.

Upside scenario

Should DPU make material progress toward meeting its capital needs while sustaining robust financial metrics, coupled with reduced accounts receivable, we could raise the rating."

3. From Fitch Ratings' Press Release dated August 15, 2023:

Fitch Ratings affirmed the System's AA rating in connection with the issuance of the Series 2023C Bonds. Excerpts from their August 15, 2023 Press Release have been provided below:

"*Factors that Could, Individually or Collectively, Lead to Negative Rating Action/Downgrade*

- *Sustained leverage above 7.0x in Fitch's base and rating case scenarios, provided maintenance of current revenue defensibility and operating risk assessments;*
- *Weakening of service area characteristics or affordability resulting in downward revision of the revenue defensibility assessment.*

Factors that Could, Individually or Collectively, Lead to Positive Rating Action/Upgrade

- *Sustained leverage below 5.0x in Fitch's base and rating case scenarios, provided maintenance of current revenue defensibility and operating risk assessments."*

Potential Downgrade Impact(s)

A rating downgrade would increase the borrowing costs for the City. Market conditions at the time of issuance will dictate the difference between one rating level and another. But for argument's sake, if we were to see what a 1% interest rate increase due to rating downgrade(s) would be on $1.15 billion, the total increase in interest payments would be nearly $220 million over the life of the debt issued. **We understand there may be grant funds and other special loan programs that might become available. Nevertheless, the increased interest rate impact could be very significant.**

Ramifications Beyond the Bond Market

In order to support the additional debt discussed above, user rates would have to be increased markedly.

Within the City Utility System, the City of Richmond Wastewater System is in reality a "Regional System." The major stakeholders go beyond the City, including several other central Virginia localities as well as major international/national businesses. These user rates could potentially put the City, its customers

and regional partners, at levels that will be so far above the peer Virginia and National averages that it could have a major negative impact on economic development for both existing and prospective business. These necessary user rate increases could totally cripple the City's competitiveness in the area of business retention and development. Moreover, the hefty increase in user rates could actually result in a loss of existing customers. This possibility would further exacerbate the already projected user rate increases estimated for the current customers.

To that end, we would recommend that an economic impact study be developed to determine the true all in potential cost(s) to the City, and its regional partners. We at Davenport, in our capacity as Financial Advisor to the City, are concerned that, as well intentioned as the federal/state authorities are vis-à-vis improving the sanitary sewer system for the good of the Central Virginia region and the environment as a whole, it could pose a catastrophic effect on Richmond's overall financial viability and future sustainability.

Specifically, our concern is greater than the impact of asking Richmond citizens/customers to pay two-to-three times the current level of monthly user rates to cover increased wastewater bills. Also, it should be noted that roughly one in four Richmond residents live at or below the "poverty level". This makes any meaningful increases in monthly living expenses especially difficult for our most financially challenged citizens.

Our additional concern is the overall impact the user fees will have on existing businesses and future economic development. As such, our proposal for a more holistic, multi-year economic development impact study is recommended. Our belief is that, while in the immediate term a rating downgrade is likely, this impact is only the tip of the iceberg as to the true long term economic impact to the City and region.

Customer Impact

Raftelis, the City's Utility System's rate consultant, utilized the City Utility System's rate and financial planning model to see what impact a potential $750 million (assuming $300 million below market) and a $1.15 billion increase in debt might have on rate payers. Their analysis shows that Wastewater rates would have to increase almost 160% under the $750 million borrowing scenario and around 220% under the $1.15 billion borrowing scenario during the next time frame required to comply (2035). That means customer rates would more than double and triple from today's level, respectively. The chart on the following page shows where a Utility Wastewater customer monthly bill using 6 ccf is both today and in 2035 under each scenario versus other highly rated peer systems.

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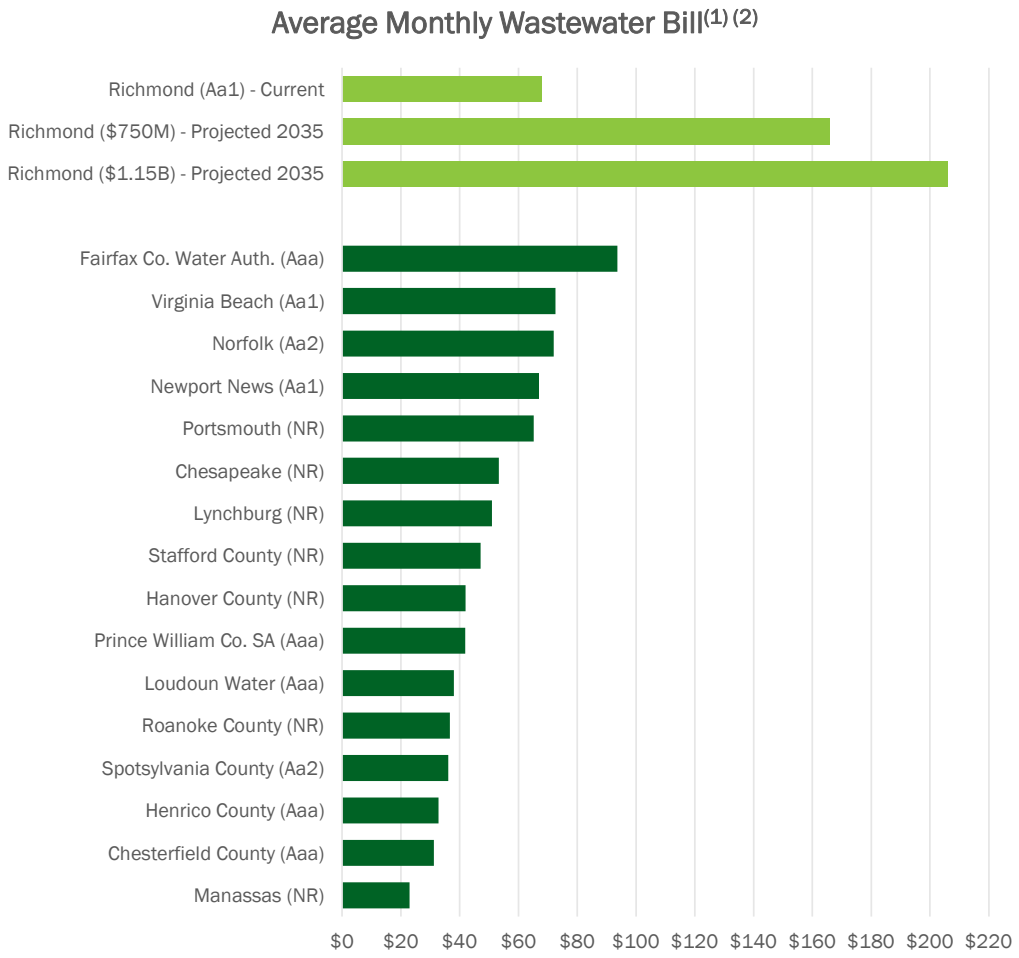

(1) "Richmond – Current" and all peer average monthly bills are as of July 2022. "Projected 2035" figures for Richmond are based upon projections prepared by Raftelis.

(2) Ratings reflect current utility ratings as assigned by Moody's. NR designates entities with no current underlying utility credit rating from Moody's.

Source: City of Richmond, Department of Public Utilities Annual Bond Disclosure & Raftelis.

Conclusion

In conclusion, while we believe the City's Utility System would be able to access the funds needed in the open market, it would come with a costly price in the form of rating downgrades. Based upon the most recent rating reports the City's Utility system would most certainly be downgraded and, as a result, Utility customers would be paying more in user rates due to the increased annual debt service. Wastewater customers would by far have the most expensive monthly bills in the Commonwealth. Further, our concern as stated previously, is that these user rate increases could severely damage the City's competitiveness in the area of business retention and development. The ramifications of these rate increases would be felt for many years and could be a multiple of the direct increased expense in debt service for Utility customers. The ripple effect of these new user rates could impact the entire Central Virginia region's competitiveness and long term fiscal stability/sustainability.

David P. Rose

Senior Vice President & Manager of Public Finance

Davenport & Company LLC

Courtney E. Rogers

Senior Vice President

Davenport & Company LLC

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