



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, 2024

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

Subject: City of Richmond 2024 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 undertaken to address the combined sewer system (CSS) Interim and Final Plans. This report demonstrates 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 vitally important James River and the environment.

The City is conducting ongoing operation and maintenance (O&M) activities, implementing projects identified in the Interim Plan, and moving forward with implementation of the projects identified in the approved Final Plan, as required by the Consent Order and Chapter 634 (2020 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 2024 General Assembly Report provides updates on:

- Interim Plan implementation
- Final Plan project selection and implementation
- Other ongoing CSS Capital Improvement and O&M Clean Water projects
- Community engagement and outreach
- Costs and funding sources

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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 partnering with various stakeholders to help identify and prioritize ways to enhance the well-being of the James River.

The CSS projects required by the Consent Order build upon the efforts the City already has underway. The City values its partnership with the General Assembly and VADEQ in focusing on water quality improvements to the James River, and the funding and incentives necessary to implement those improvements.

As this report reflects, the City has accomplished several significant activities/milestones to meet the schedule requirements of the Consent Order, while continuing to maintain and improve the CSS:

Interim Plan

- Construction of four of the ten Interim Plan projects is in progress. All ten projects will be complete by July 1, 2027 to meet the Consent Order deadline

Final Plan

- Submitted the Final Plan to the VADEQ on June 13, 2024, with VADEQ approval received on August 7, 2024
- Design of two of the four Final Plan projects is underway

Other CSS Projects

- Screening and Grit Facility at the WWTP (CSS Special Order Project #15) is in operation
- Cleaning of the Shockoe 96-inch interceptor and Twin 66-inch siphons is nearly complete (these sewers convey approximately 70% of the City's wastewater flow)
- Cleaning of the City's Shockoe Retention Basin and Hampton/McCloy Storage Tunnel is in procurement

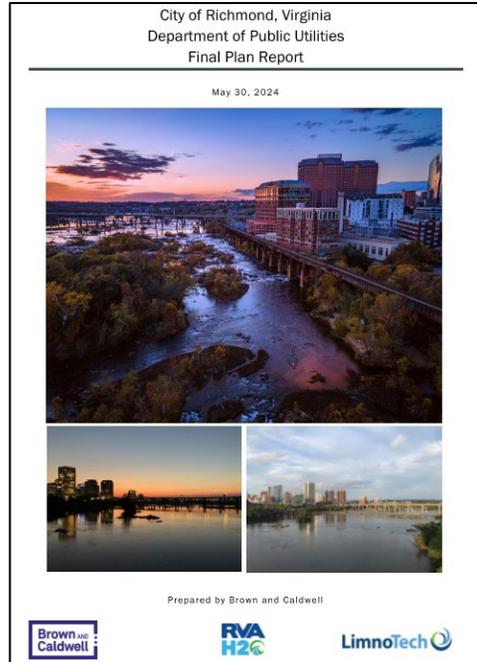
The City's next steps for 2025 include:

- Finalize the design of the remaining six Interim Plan projects
- Complete the detailed design of two of the four Final Plan projects and advance them to construction
- Procure design services for the two larger Final Plan projects (Shockoe high-rate

- disinfection and CSO 040 Storage Tank)
- Continue implementation of other clean water projects
- Advance public engagement and communication



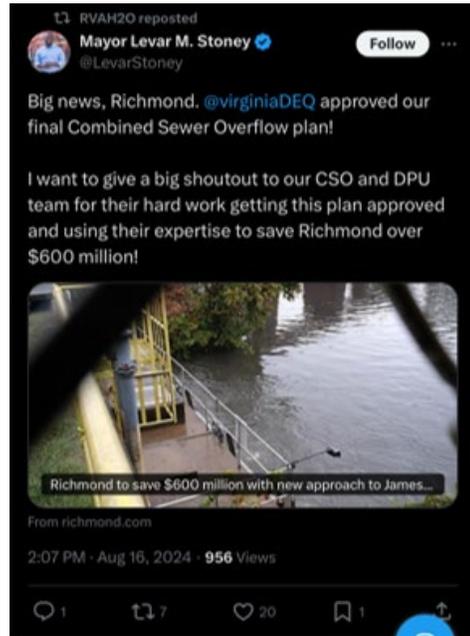
Construction of Outfall 004 Interim Plan Project



The Final Plan was submitted to VADEQ on June 13, 2024 and approved on August 7, 2024



Shockoe 96-Inch Interceptor and Twin 66-Inch Siphon cleaning



RVAH2O X Repost – Final Plan Acceptance

SECTION A: BACKGROUND

Richmond’s CSS is the largest in VA

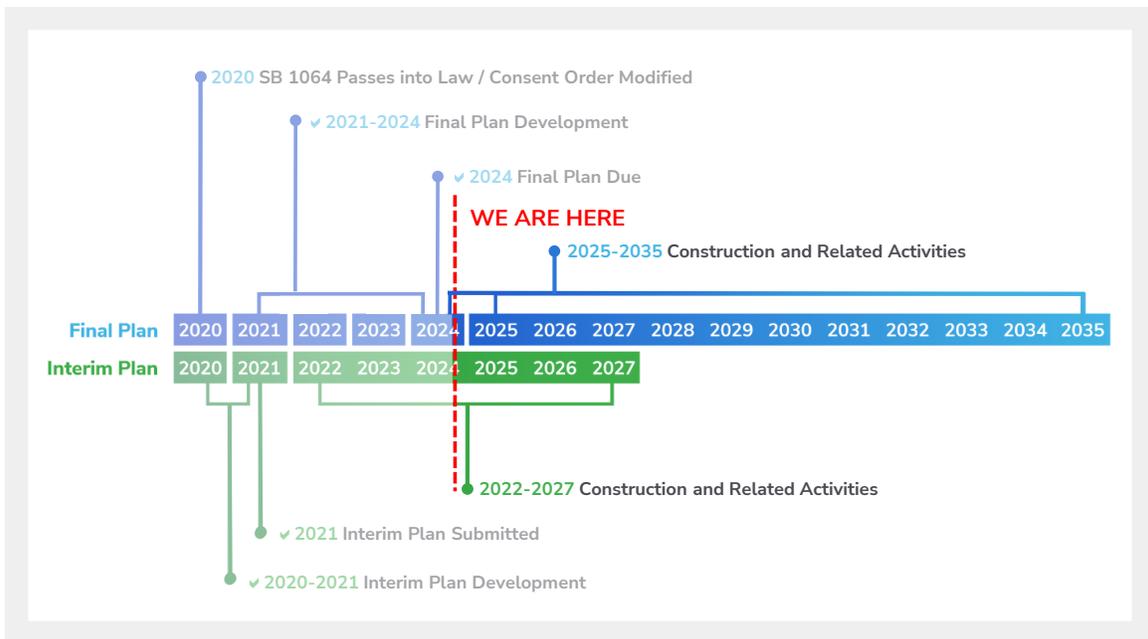
Parts of the City’s sewer system are over 150 years old and were originally designed as a combined sewer system (CSS). In the CSS, the pipes were constructed to transport both wastewater and stormwater. During wet weather events the vast majority of flow is stormwater. As a result, the CSS can become 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 (~90%) but also contain some wastewater.

Since 1970, the City and the Commonwealth of Virginia have invested more than \$780 million (adjusted to today’s dollars) on projects that have reduced overflow volumes by approximately 80% on an annual average basis.

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 for completion by 2027 and Final Plan, to be completed by 2035. 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. Consent Order Timeline



SECTION B: INTERIM PLAN IMPLEMENTATION STATUS

- ✓ Four of the ten projects are in construction
- ✓ Remaining six projects are at 90% design

The Interim Plan identified ten projects that will reduce CSO volume by approximately 180 million gallons on average per year. These projects are on track to be complete by July 1, 2027 to comply with the City’s Consent Order deadlines.

The City’s priorities over the next six months are to finalize the design of the remaining six Interim Plan projects, procure construction services and continue on-going construction.

Figure 2. Interim Plan Project Status



Project		Estimated Annual Overflow Volume Reduction (MG)	Estimated Construction Cost (in today's dollars)	Purpose	Estimated Completion Date
1	Level 1 Controls (SRB and Hampton/McCloy Tunnel)	79	\$2M	Automate the drainage of the 35-MG Shockoe Retention Basin and the 7-MG Hampton/McCloy storage tunnel	Fall 2025
2	Level 2 Controls (WWTP Main PS)	41	\$0.5M	Optimize the operation of the WWTP Main PS to maximize the use of the 140 MGD WWTP	Spring 2026
3	CSO 021 Inline Storage	16	\$5M	Regulator Replacement to utilize in-line storage	Fall 2026
4	CSO 040 Inline Storage	12	\$4M	Installation of a new in-line storage structure	Fall 2026
5	CSO 019A Diversion	10	\$1M	Install controls to divert flow between the Shockoe Retention Basin and the Hampton/McCloy storage tunnel	Fall 2026
6	CSO 020 Diversion	9	\$2M		Summer 2026
7	CSO 004 Regulator Replacement	5	\$17M	Regulator replacement to provide inline storage and convey additional wet weather flow to downstream sewer as capacity is available	Summer 2025
8	CSO 024 Underflow Control	4	\$0.5M	Install controls to convey additional wet weather flow to downstream sewer as capacity is available	Fall 2025
9	CSO 039 Underflow Control	4	\$1M		Fall 2025
10	CSO 019B Diversion	2	\$1M	Install controls to divert flow between the Shockoe Retention Basin and the Hampton/McCloy storage tunnel	Fall 2026
Total		182	\$34M		

SECTION C: FINAL PLAN STATUS

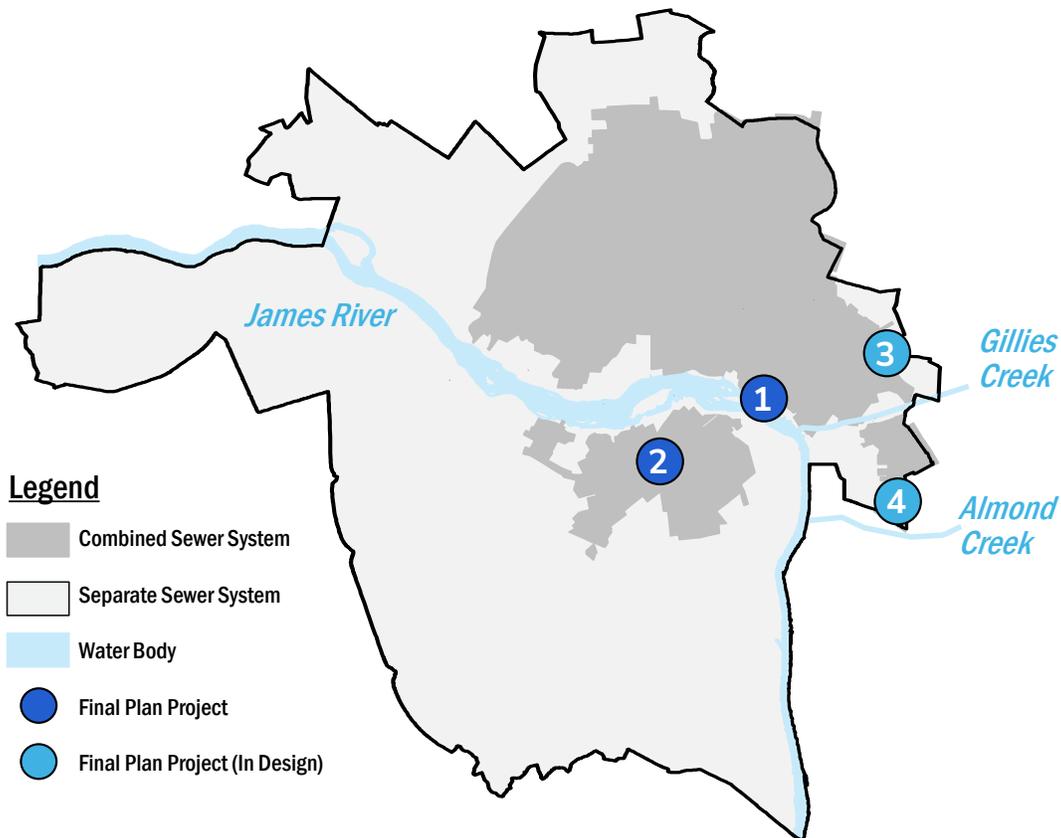
- ✓ Selected four projects exceed the Consent Order Requirements
- ✓ Estimated cost of \$575 million is 40% of the 2022 estimate

The Final Plan report was submitted to the VADEQ on June 13, 2024 that identified four essential projects. When implemented, these projects will exceed the performance requirements of the Consent Order and also further assist the City in meeting the 2010 James River Bacteria TMDL in the Gillies Creek and Almond Creek tributaries.

These four projects were selected because they are the most cost-effective projects while providing the following benefits:

- Reduce annual average overflow volume by 785 MG or 75%
- Provide a 96% CSO capture rate in an average year
- Reduce 30% more bacteria than the 2002 LTCP projects at 50% of the cost
- Create opportunities to provide community improvements (parks, public access, etc.) in Canoe Run Park and on Chapel Island

Figure 3. Final Plan Projects



Project		Estimated Annual Overflow Volume Reduction (MG)	Estimated Cost (mid-point of construction)	Purpose	Estimated Completion Date
1	Shockoe #1 HRD Facility	691	\$340M	New 1,000-MGD high-rate disinfection facility that will be constructed within the existing Shockoe Retention Basin	Fall 2034
2	Southside #1 Storage Facility	83	\$160M	New storage facility that will reduce approximately 25 overflow events per year	Fall 2034
3	Gillies Creek #1 Storage Facility	4	\$30M	New storage facility that will reduce approximately 12 overflow events to Gillies Creek per year	Fall 2026
4	Hilton Street #1 CSS Separation	7	\$35M	Separation of the Hilton Street drainage area that will remove CSO overflow events to Almond Creek	Fall 2026
5	Citywide Green Infrastructure	<1	\$10M	Reduce stormwater runoff into CSS	Spring 2035
Total		785	\$575M		

Project 3 (The Gillies Creek #1 Storage Facility) and Project 4 (Hilton Street #1 Separation) projects are currently under design and will be funded through the existing American Rescue Plan Act (ARPA) funding, received by the Commonwealth for investments in wastewater infrastructure.

Project 1 (the HRD Facility at Shockoe) provides the greatest benefit of all the projects, providing approximately 90% of the overflow bacteria reduction, and is the key driver in improving water quality in the James River. The City anticipates having this project ready for bid/construction by 2029. In order to proceed to construction, the City will need to implement a funding plan that is affordable to ratepayers and residents of the City.

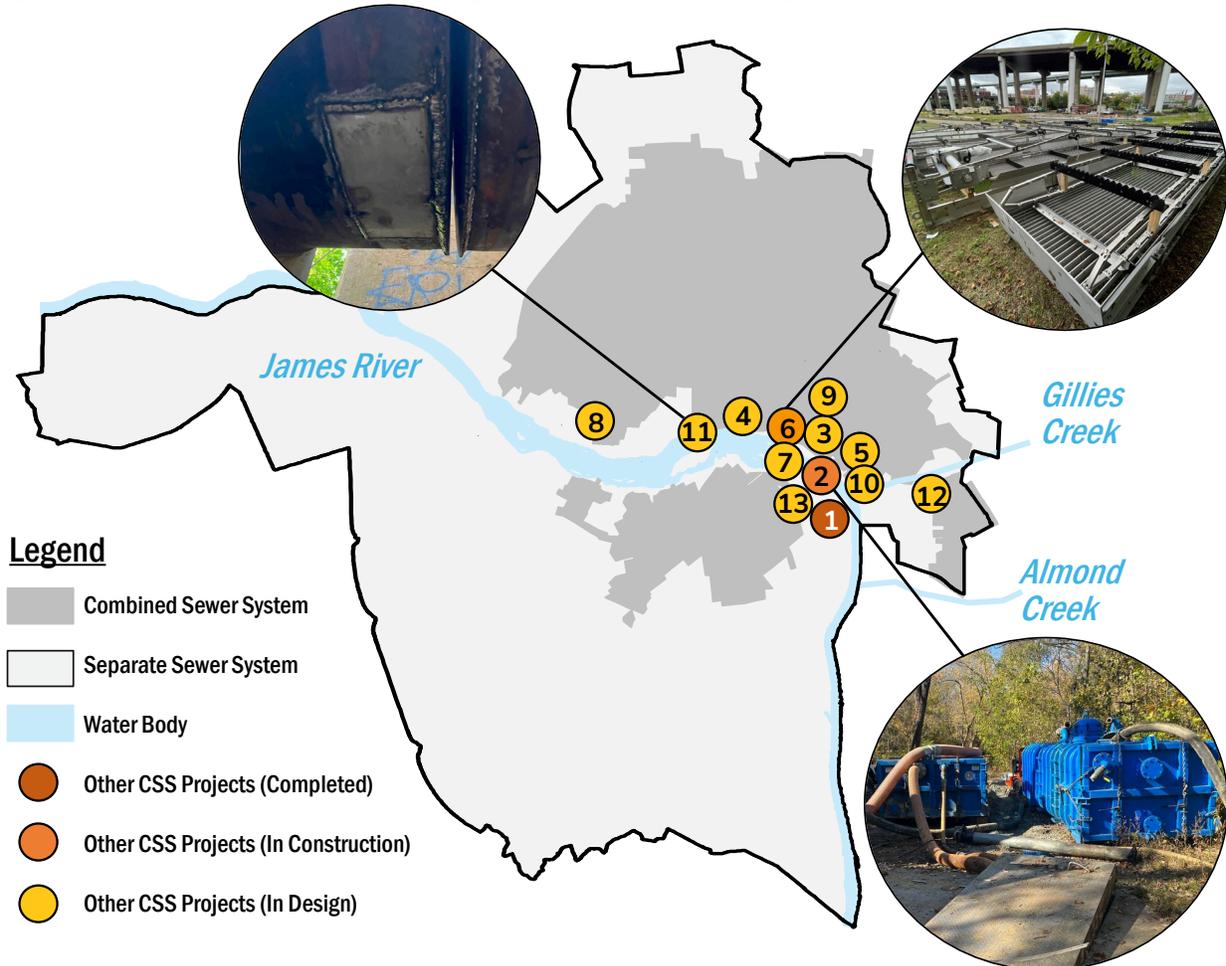
SECTION D: OTHER ONGOING CSS CLEAN WATER PROJECTS

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.

CSS Facilities: The City’s CSS contains 25 outfalls, 40 regulator structures, and two storage facilities (Shockoe Retention Basin and Hampton/McCloy tunnel). Operations and maintenance activities and capital improvement projects are ongoing to maintain and improve the functionality of these facilities.

Wastewater Treatment Plant (WWTP) Improvements: Operation of the WWTP in wet weather is critical to limit CSO volume and events. 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.

Figure 4. Locations of Other Ongoing CSS Clean Water Projects



Project		Estimated Cost (in today's dollars)	Purpose	Estimated Completion Date
1	WWTP Screening and Grit Facility	\$40M	Installation of a new Screening and Grit Facility	Complete
2	Shockoe 96-Inch Sewer and Twin 66-Inch Siphon Cleanings	\$3M	Cleaning critical interceptors to reinstate the conveyance capacity of the sewers	Early 2025
3	Shockoe Retention Basin and Hampton-McCloy Tunnel Cleaning	\$11M	Cleaning critical storage facilities to reinstate the storage capacity	Summer 2025
4	Regulator Improvements	\$2M	Upgrading equipment in seven regulator structures	Fall 2025
5	Shockoe Retention Basin Roof Repairs	\$2M	Rehabilitation of the Shockoe Retention Basin roof	Spring 2026
6	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
7	Outfall 006 Regulator Improvements	\$1M	Upgrade Outfall 006 to prevent tidal intrusion from the James River into the CSS	Fall 2026
8	Hampton St. Pump Station (PS) Improvements	\$1M	Upgrade the electrical and control system at the PS	Fall 2026
9	Dock Street PS Improvements	\$1M	Upgrade the electrical and control system at the PS	Fall 2026
10	CSO 005 Regulator Replacement	\$2M	Replacement of the CSO 005 Regulator to improve future O&M activities and to reduce overflow volume and events	Fall 2026
11	Hollywood Interceptor	\$5M	In July 2024, a leak was observed from the Hollywood Interceptor into the James River. The failed section of pipe was isolated and taken off-line (to stop the leak), while the upstream flow was diverted into a parallel sewer. The City is currently designing a permanent bypass solution which will allow the failed section of pipe to be removed	Fall 2026
12	CSO 024 Partial CSS Separation	\$2M	Separate the influent stormwater channel that drains approximately 40 acres from the CSO 024 drainage area	Fall 2026
13	WWTP Main PS Improvements	\$63M	Rehabilitation of the existing WWTP Main Pump Station.	Fall 2027
Total		\$161M		

SECTION E: COMMUNITY ENGAGEMENT AND OUTREACH

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

Throughout the process of addressing the 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.

RVAH2O Technical Stakeholder Group (2014 - Ongoing)



RVAH2O Technical Stakeholder Group consists of dozens of representatives from the community, including environmental groups and public and private stakeholders. This group meets to receive updates on the City’s progress on meeting goals identified in the integrated permit planning process and to provide feedback on the Interim and Final Plan development and projects.

Public Stakeholder Group (PSG) (2022 - 2024)

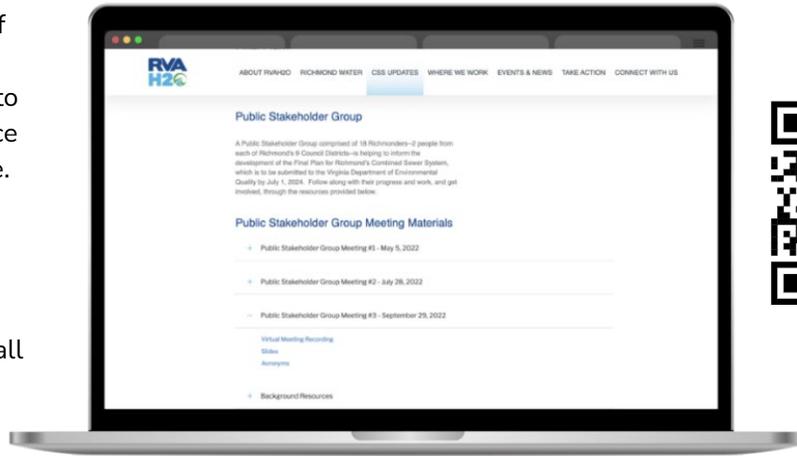


The City formed a new PSG to assist in the development of the Final Plan. This 18-person group includes two members from each of the City’s nine Council districts. The PSG met with the City’s Project Team on a bi-monthly basis throughout the development of the Final Plan to:

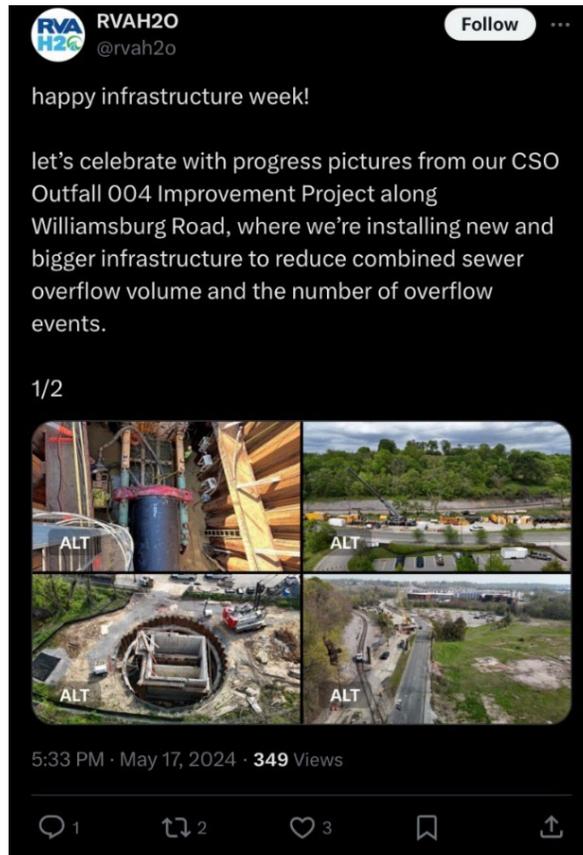
- Review and monitor the development of the Final Plan
- Provide input and insight from their communities

Online Engagement (RVAH2O Website and Social Media)

The Department of Public Utilities has worked diligently to continually enhance its digital presence. Background information on the CSS, resources, reports, and PSG presentations are all maintained on the RVAH2O.org website.



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, Interim and Final Plan milestones, as well as general CSS education.



RVAH2O FLOW Brand

With VADEQ’s approval of the Final Plan, Richmond DPU is branding Richmond’s CSS Program to ‘RVAH2O FLOW’. The purpose of the brand is to leverage the brand recognition RVAH2O has gained since its launch in 2014 with the added emphasis on the mission to significantly reduce CSO volume and activations to improve the water quality of the James River, Gillies Creek, and Almond Creek. The acronym FLOW, **For the Love of Our Waterways**, emphasizes how the investment in this Program will create a brighter future for our families, our businesses, and our River. The RVAH2O FLOW brand logo and brand statement are provided below.



“RVAH2O FLOW is an initiative implemented by the City of Richmond to achieve a cleaner and healthier James River. Upgrades to the existing combined sewer system will prevent millions of gallons of wastewater mixed with stormwater from polluting Richmond and Virginia’s waterways. Our shared goal is to protect and preserve the James River for Virginia’s wildlife and future generations.”

RVAH2O FLOW Program Leadership

This year, the City announced Robert Stone as Program Director for RVAH2O FLOW. With more than 33 years of experience as a Capital Project Administrator and Water/Wastewater Utility Engineer, Mr. Stone is well positioned to ensure the successful implementation of the Program. As Program Director, Mr. Stone is a member of the Program Steering Committee, a five-member group comprised of senior DPU leadership that provides strategic oversight, resources, and direction in support of the Program’s success. He also leads the Core Program Team, a multidisciplinary group of more than 20 professionals including consulting engineers, program management and construction management experts, that collaboratively manage the planning, design, procurement, construction, public outreach, funding, and regulatory components of the Program.



RVAH2O FLOW Communications Plan

The objective of the RVAH2O FLOW communications plan is to effectively share information to educate, inspire, and engage stakeholders about the impacts, benefits, and funding needs of the Program. The primary location for this information will be available to the public on a

dedicated Program page on the RVAH2O website. Throughout the implementation of the Program, this dedicated page will provide schedules, infographics, upcoming and past meetings, and FAQs. For construction related activities the website will be a community resource for construction information, traffic impacts, and interactive project maps. In addition, the City will leverage the RVAH2O social media pages on Facebook, X, and Instagram to compliment the website.

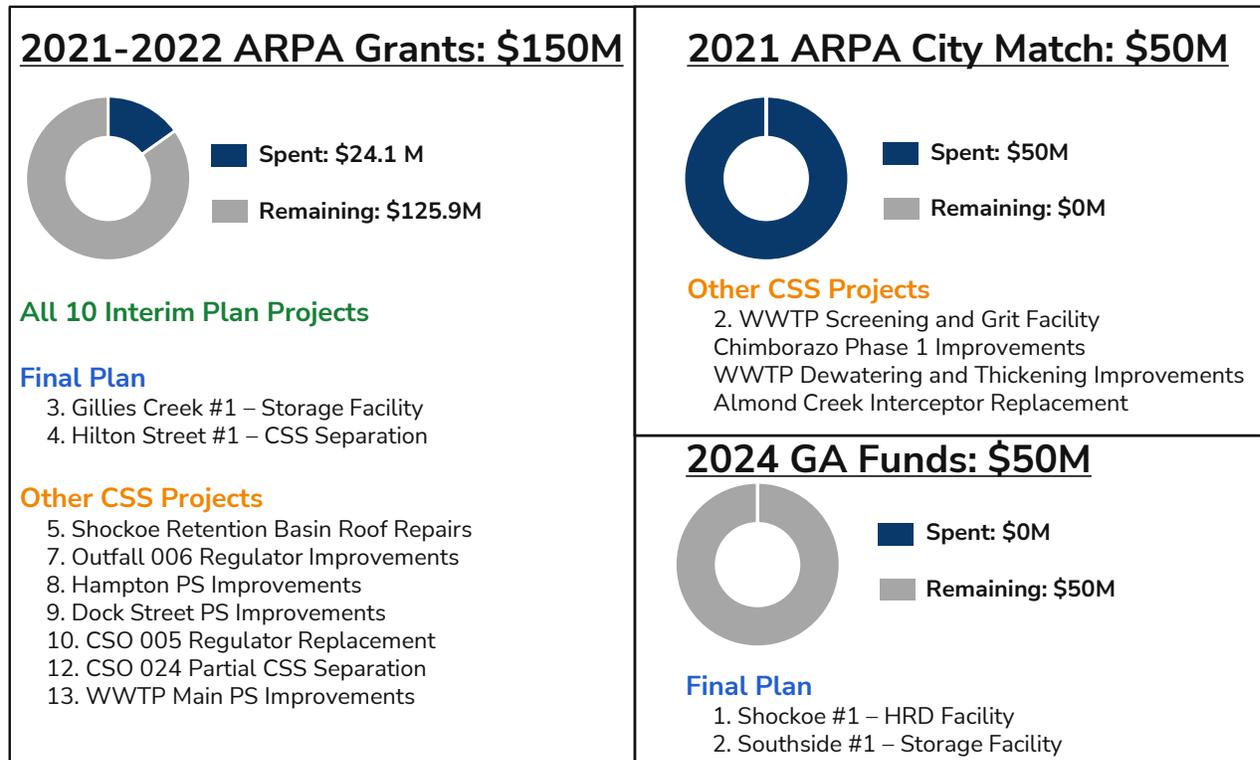
SECTION F: COSTS AND FUNDING SOURCES

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
- ✓ \$50 million appropriation in 2024 for FY25

The City is utilizing these funds to design and build the Interim and Final Plan projects, while also implementing other CSS projects.

Figure 5. Status of Appropriated Funds



In addition to the recent General Assembly appropriated funds, the City has applied the following level and sources of funding to the CSS over the past five fiscal years.

Figure 6. CSS Funding – Last Five Years

Source	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	5-Year Totals
Virginia Revolving Loan Fund	\$0	886,551	3,867,832	12,669,050	7,185,675	\$24,609,108
Grant Receipts	\$10,351,801	\$0	\$1,271,149	\$983,193	\$33,568,380	\$46,174,523
Wastewater Revenue Bonds / Operating Cash	-\$8,871,014	\$5,007,880	\$9,040,919	\$3,570,082	-\$18,080,167	-\$9,332,300
Total CSS Expenditures	\$1,480,787	\$5,894,431	\$14,179,900	\$17,222,325	\$22,673,888	\$61,451,331

The estimated cost of the four Final Plan projects is approximately \$565 million, with an additional \$10 million committed to install green infrastructure, for a total of \$575 million

Utilizing the existing appropriated funds (including the \$50M grant funding provided by the Commonwealth in FY25) to design the four Final Plan projects and build two (Gillies Creek #1 and Hilton Street #1), the remaining funding needed to complete the Final Plan is \$450 million

A financial rate analysis was conducted during the development of the Final Plan. This evaluation demonstrated that:

- The City’s rates are among the highest in the Commonwealth, in both raw dollars and % of median household income.
- The City’s rates can be characterized as having a high/medium impact on the customer base in accordance with the EPA’s lowest quintile poverty indicator (LQPI) metric.
- An average annual rate increase of 4.8% will be necessary to implement the Final Plan by 2035, even with the Final Plan being fully funded by grants, in order to fund other needed and significant improvements to the City’s aging water and wastewater facilities.

- Projected household income growth through 2040 is estimated at approximately 4%. Increasing utility rates beyond 4% per year will exacerbate the financial impact to City residents, worsening the City’s affordability issues.

The City will need additional financial grant funding support of approximately \$450 million over the next four years to meet the July 1, 2035 Final Plan construction completion deadline.

The City will be ready to procure construction services for the two Final Plan projects (Shockoe #1 and Southside #1) in the 2028 to 2029 timeframe. If the City has not secured grant funding guarantees for a substantial portion of the cost of these projects, the City will not be in a financial position to incur the additional debt needed to advance these large projects approved in the Final Plan to construction.

As a result, the City is requesting grant funding as follows from the Commonwealth:

Date	Requested Amount	Purpose
FY 2025	Amend \$50M to \$150M	Preliminary Engineering, fund set aside
FY 2026	\$150M	Engineering, Geotech, Permitting, fund set aside
FY 2027	\$100M	Fund Set Aside – Construction/design
FY 2028	\$100M	Fund Set Aside – Construction/design
TOTAL	\$500M	

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), concurrent with the execution of the Final Plan projects:

- Justice40 Initiative
- Build Resilient Infrastructure and Communities (BRIC Grants)
- EPA Sewer Overflow and Stormwater Grant Program
- Clean Water State Revolving Loan Fund (CWSRLF)
- Water Infrastructure Finance and Innovation Act (WIFIA) loans

The City applied for a \$5,400,000 Congressionally Directed Spending grant from Congress in Fiscal Year 2024. Senators Kaine and Warner and Congresswoman McClellan formally requested funding for the WWTP Main PS Improvement project. Ultimately, Congress awarded the City \$959,752 for the project.

This concludes our report. The City of Richmond Department of Public Utilities appreciates the opportunity to provide this update on the vital work underway and the partnership that VADEQ 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 Bingham

April N. Bingham, Senior Director

Copy:

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Lincoln Saunders, Chief Administrative Officer, City of Richmond

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Cynthia I. Newbille, City Councilmember, 7th Voter District

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