



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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To: The Honorable Ralph S. Northam, Governor

The Honorable Matthew J. Strickler
Secretary of Natural Resources

The Honorable Thomas K. Norment, Jr.
Co-Chairman, Senate Committee on Finance

The Honorable Emmett W. Hanger, Jr.
Co-Chairman, Senate Committee on Finance

The Honorable Richard H. Stuart
Chairman, Senate Committee on Agriculture, Conservation and Natural Resources

The Honorable S. Chris Jones
Chairman, House Committee on Appropriations

The Honorable Daniel W. Marshall III
Chairman, House Committee on Agriculture, Chesapeake and Natural Resources


The Honorable Frank W. Wagner
Chairman, Chesapeake Bay Commission

The Honorable Robert S. Bloxom, Jr.
Member, Chesapeake Bay Commission

The Honorable David L. Bulova
Member, Chesapeake Bay Commission

The Honorable Tony O. Wilt
Member, Chesapeake Bay Commission

Dennis H. Treacy
Member, Chesapeake Bay Commission

From: David K. Paylor 

Date: January 1, 2019

Subject: Combined Sewer Overflow Outfall Progress Report (2018)

In accordance with the 2017 Virginia Acts of Assembly Chapters 826 and 827, the Department of Environmental Quality is transmitting the attached 2018 General Assembly Report for VPDES Permit VA0087068 from Alexandria Renew Enterprises (AlexRenew).

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



November 1, 2018

Tom Faha, Director
Virginia Department of Environmental Quality
Northern Regional Office
13901 Crown Court
Woodbridge, VA 22193-1453

Subject: 2018 General Assembly Report for VPDES Permit VA0087068

Dear Mr. Faha:

In accordance with Virginia Pollutant Discharge Elimination System (VPDES) Permit VA0087068, Alexandria Renew Enterprises (AlexRenew) is submitting this letter to report on the implementation status of the approved 2018 Long Term Control Plan Update (LTCPU).

On June 29, 2018, the Virginia Department of Environmental Quality (VDEQ) approved the LTCPU jointly prepared by AlexRenew and the City of Alexandria. The LTCPU recommended Option B+ as the solution to remediate Alexandria's four existing combined sewer outfalls and featured a unified tunnel system coupled with upgrades to AlexRenew's Water Resource Recovery Facility (WRRF) to capture and treat combined sewer discharges.

Following the approval of the LTCPU, AlexRenew and the City of Alexandria executed an Outfall Transfer Agreement that transferred the existing combined sewer system outfall assets to AlexRenew, which was approved by City Council on June 26, 2018. The agreement assigned ownership of the four existing combined sewer system regulators and outfalls to AlexRenew. Additionally, the agreement also made AlexRenew solely responsible for the regulatory compliance responsibilities associated with the outfalls, including the planning, design, and construction of the recommended LTCPU plan. A copy of the Outfall Transfer Agreement is provided as Attachment A to this letter. The City of Alexandria will continue to be involved in the plan's implementation via three main channels including: a workgroup consisting of City Council and AlexRenew board members, a regulatory review team, and involvement at regularly-occurring coordination meetings.

On September 1, 2018, VDEQ recognized the transfer of the existing combined sewer system assets by issuing VPDES Permit VA0087068 to AlexRenew. This permit was previously issued to the City of Alexandria and establishes regulatory requirements for the existing combined sewer system. A condition in the permit requires AlexRenew to report on the progress of the implementation of the recommended LTCPU plan by November 1st of each year.

Defining the Concepts Outlined in the LTCPU

In order to effectively communicate the outcomes and importance of implementing the LTCPU, AlexRenew, with support from the City of Alexandria, branded the approved LTCPU plan as “RiverRenew” in July 2018. The brand and its tagline “investing in healthier waterways for Alexandria” illustrate the commitment to, and benefits of addressing Alexandria’s combined sewer system issue by 2025.

While the LTCPU provided the conceptual framework to comply with the legislative requirements associated with the 2017 Virginia Law, it did not provide detailed project definition and procurement needs. Therefore, the first major task following the LTCPU approval was to succinctly define each project, establish methods and protocol for the procurement of each project, develop detailed schedules, and plan for the availability of sufficient space at AlexRenew’s constrained site to ensure completion by the legislative milestone. The process identified four major RiverRenew projects totaling approximately \$400 million that include:

- the expansion of AlexRenew’s primary treatment capacity from 108 to 116 million gallons per day (MGD);
- the relocation of facilities and decommissioning of AlexRenew’s former administrative building;
- construction of a tunnel system and associated pumping stations; and
- modifications to the primary treatment systems at AlexRenew to provide disinfection of wet weather flows.

Table 1 provides a summary of the RiverRenew projects and their major components. The general implementation timeline for each project from planning through construction is illustrated in Figure 1 below.

Table 1. Proposed RiverRenew Projects

Project	Description
108-116 MGD Expansion	<ul style="list-style-type: none"> • Upgrades to primary effluent pumps • Modifications to filter effluent backwash system
Building J Facilities Relocation and Decommissioning	<ul style="list-style-type: none"> • Relocation of the WRRF lab and other facilities • Disconnection and relocation of utilities • Demolition of Building J
Tunnel System	<ul style="list-style-type: none"> • Construction of a storage and conveyance tunnel to control overflows from Outfalls 001 and 002 • Construction of a diversion sewer to control overflows from Outfalls 003 and 004 • Installation of a 40-60 MGD tunnel dewatering pumping station and associated equipment • Installation of pumps up to a capacity of 130 MGD in the existing pumping station wet well under the WRRF’s Nutrient Management Facility
Wet Weather Treatment Facility	<ul style="list-style-type: none"> • Modifications to WRRF primary settlement tanks • Installation of sodium hypochlorite system and dechlorination system • Upgrades to an existing outfall pipeline

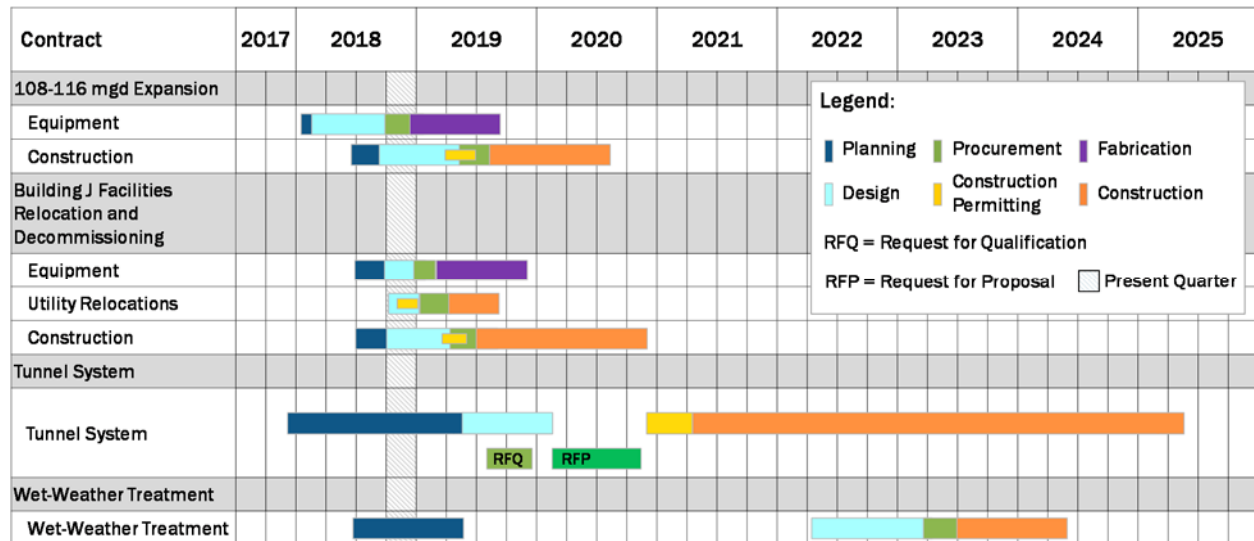


Figure 1. RiverRenew Program-wide Implementation Schedule

Implementation Progress

On October 29, 2018, AlexRenew submitted a draft Preliminary Engineering Report (PER) to VDEQ for RiverRenew. The draft PER provides a thorough analysis of the proposed engineering alternatives for the RiverRenew projects with considerations for potential impacts to the community, regulatory and permitting requirements, existing conditions, operations and maintenance, procurement methodologies, cost, and schedule to meet the July 1, 2025 legislative mandate. The draft PER concluded with technically preferred alternatives for each project and significantly advanced the design in a relatively short timeframe. The draft PER Executive Summary is provided as Attachment B to this letter.

It should be noted that due to the accelerated timeline required to comply with the schedule mandated by the 2017 Virginia Law, the PER is being developed concurrently with the RiverRenew Environmental Assessment (EA). The EA is required to comply with the National Environmental Policy Act of 1969 since portions of the program require permits and approvals from the National Park Service to potentially construct within property under their ownership. Development of the EA requires significant community outreach in order to receive feedback to make an informed decision on a preferred alternative, which is expected to be finalized in April 2019.

The Virginia Administrative Code requires PERs to identify a “selected alternative.” In order to maintain the integrity of the EA process and the feedback received from the community, the draft PER did not identify a selected alternative, but recommends a technically preferred alternative based on engineering judgement, cost, and schedule. The EA will continue to further study the environmental and community impacts for all alternatives identified in the draft PER and will conclude with a decision document recommending a preferred alternative. Under no circumstances does the PER preempt the EA or its process.

A summary of progress made for each project in 2018 is summarized in Table 2, while the following list notes major advancements since the approval of the LTCPU:

- **108-116 MGD Expansion.** Issuance of contract documents for the pre-purchase of primary effluent pump equipment
- **Building J Facilities Relocation and Decommissioning.** Development of a recommendation for relocating AlexRenew’s main lab, chiller plant, and electrical facilities to other locations at the WRRF
- **Tunnel System.** Developed and analyzed approximately 30 alternatives for the locations of the tunnels and associated infrastructure. Recommended a technically preferred alternative, which included 10 percent level design drawings
- **Wet Weather Treatment Facility.** Conducted extensive testing during wet weather to determine applicable doses of sodium hypochlorite to achieve bacteria kills

Table 2. Implementation progress and milestones for RiverRenew as of November 1, 2018

Project	2018 Progress and Milestones
108-116 MGD Expansion	<ul style="list-style-type: none"> • Evaluated alternatives for Primary Effluent Pump Station upgrades • Identified replacement of impellers as the technically preferred alternative • Issued contract documents for equipment pre-purchase
Building J Facilities Relocation and Decommissioning	<ul style="list-style-type: none"> • Identified the need to demolish Building J to accommodate tunnel construction • Evaluated and identified a technically preferred alternative for the relocation of Building J facilities
Tunnel System	<ul style="list-style-type: none"> • Evaluated and identified technically preferred alternatives • Developed over 60 design drawings in support of the PER • Kicked-off the EA process through a series of public Listening Sessions to solicit community feedback • Worked closely with the National Park Service to develop draft EA sections • Coordinated with multiple third-party stakeholders to discuss easement and permit needs to install the tunnel system • Conducted site investigations consisting of site survey, bathymetry, wetlands delineation, and aerial flyovers • Drilled over one dozen borings to support the geotechnical subsurface exploration program • Met with a variety of community groups to engage and discuss the program
Wet Weather Treatment Facility	<ul style="list-style-type: none"> • Evaluated alternatives for wet weather treatment at WRRF • Selected a dual-use wet weather treatment facility as the technically preferred alternative • Conducted bench-scale testing to identify effective chemical doses

Stakeholder Outreach and Engagement

The development of the LTCPU included a transparent public process that provided an opportunity for the community to engage, provide feedback, and weigh-in on the recommended plan. Monthly public meetings were held with an Ad Hoc Combined Sewer System Stakeholder Group, who represented the diverse commercial and residential interests of Alexandria. The Ad Hoc group was instrumental in the development of the LTCPU and provided formal support of the plan prior to being disbanded in April 2018 after fully meeting their charge.

Following the approval of the LTCPU, community outreach efforts continued with a focus on civic and homeowner's associations to provide an overview of the recommended plan. In September 2018, a series of four public Community Listening Sessions were conducted to update the community on the proposed tunnel routes and facility locations. The sessions were focused on obtaining the community's input on the proposed alternatives to support the EA scoping process¹, and to help optimize the design to minimize impacts while achieving the program's objectives. Nearly 200 community members attended the sessions and follow-up meetings and approximately 150 comments were received on the proposed alternatives.

On October 23, 2018 Alexandria City Council passed a resolution for the establishment of the RiverRenew Stakeholder Advisory Group to be an active and informed citizen group providing diverse perspectives throughout the various phases of RiverRenew's implementation. The group is tasked with reviewing and monitoring program progress, serving as spokespeople for RiverRenew, receiving input from the public, and providing recommendations to mitigate community impacts. AlexRenew, with the support of the City of Alexandria, is currently requesting nominations and applications for members interested in serving as part of the group. The group, comprised of 13 representatives, will meet on a monthly basis starting in January 2019 and continuing through mid-2020.

AlexRenew and the City of Alexandria have been meeting on a regular basis as outlined in the Outfall Transfer Agreement. The team has been conducting bi-weekly meetings discussing details associated with program planning, design, and procurement. In addition, the regulatory team has been meeting to progress the Development Special Use Permit required by the City of Alexandria to implement RiverRenew, and the City Council/AlexRenew Board Workgroup has met monthly since August 2018.

In addition to community outreach efforts within Alexandria, AlexRenew has conducted extensive third-party coordination with federal agencies, state agencies, and private landowners that may be affected by the implementation of RiverRenew. As part of the EA process, agency scoping efforts have involved the U.S. Army Corps of Engineers, Virginia Department of Environmental Quality, Virginia Department of Transportation, Virginia Marine Resources Commission, and Dominion Energy. The NPS has also formally initiated consultation with the Virginia Department of Historic Resources under Section 106 of the National Historic Preservation Act. Additionally, AlexRenew is actively coordinating with private landowners along the potential alignments to discuss temporary and permanent easements that may be required to construct RiverRenew.

Program Cost and Funding

RiverRenew is the largest infrastructure initiative in the history of Alexandria, VA. Construction of the program in the short-term will cause disruptions throughout the City, placing a burden on the community. The spending necessary to implement RiverRenew by 2025 will also significantly impact sewer rates for decades. RiverRenew capital costs escalated to the midpoint of construction are estimated to be approximately \$400 million. This estimate is based on the current level of planning defined in the October 2018 draft PER, which includes a 10 percent level of design for the Tunnel System project. In order to fund the program and comply with the 2017 Virginia Law, substantial rate increases will be necessary.

¹ The initial scoping comment period closed October 25, 2018.

Assuming ownership in July 2018, AlexRenew has spent approximately \$10 million to date in support of RiverRenew and spending is anticipated to increase dramatically as the program advances into the design and construction phases. Figure 2 illustrates the anticipated spending over the life of the program to meet the 2025 mandate. The graph shows substantial increases in yearly spending as the program moves into construction phases by 2020. This spending directly correlates to the magnitude of rate increase necessary to fund the program. Rate increases per residential customer are estimated to be between \$20 and \$40 per month, on top of the current sewer bill. On average, Alexandria residents may be billed up to \$95 per month following the implementation of RiverRenew for water and sewer services. A detailed rate analysis is currently underway and anticipated to be complete in Spring 2019 to more clearly quantify the impacts to rate payers for this significant investment in cleaner water. Additional funding from the Virginia Clean Water Revolving Loan Fund and potential state grants will be required to finance the RiverRenew facilities.

In order to ameliorate this significant financial burden, AlexRenew intends to solicit funding from the Governor and the General Assembly for the program, similar to what has been provided for other Virginia communities with combined sewer systems.

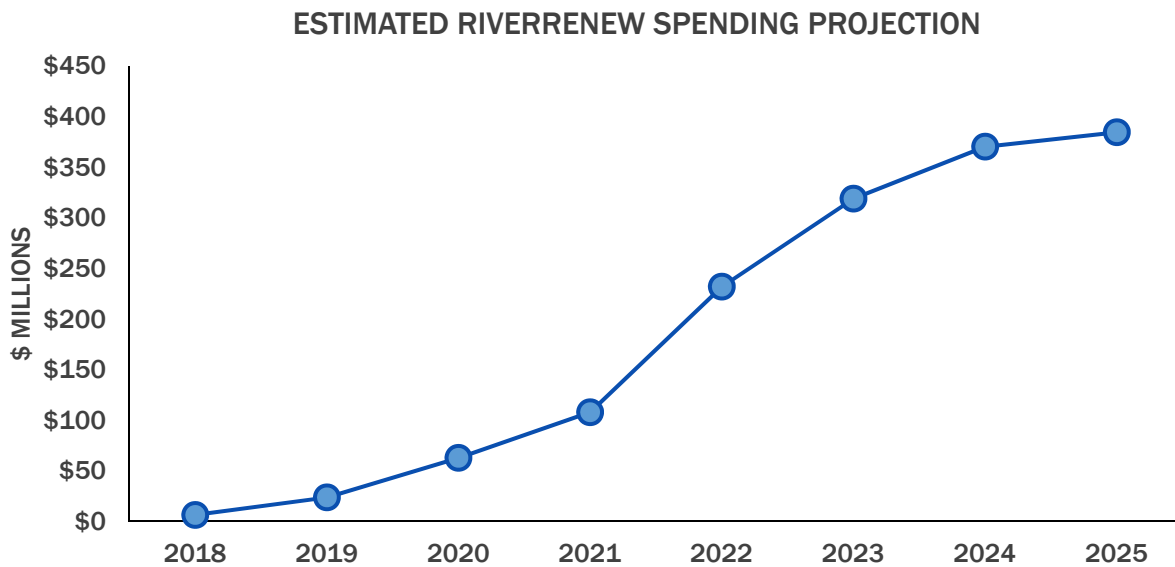


Figure 2. Estimated RiverRenew spending through 2025

Next Steps and Closing

Over the course of the next year, AlexRenew will continue to advance the implementation of RiverRenew as the various major components progress through planning, design, and construction phases. Table 3 provides a summary of the major milestones planned for RiverRenew in 2019.

Table 3. Major RiverRenew project milestones from November 2018 through October 2019

Project	Major Milestones from November 2018 through October 2019
108-116 MGD Expansion	<ul style="list-style-type: none">• Finalize design documents in January 2019• Award construction contract and provide Notice to Proceed in August 2019
Building J Facilities Relocation and Decommissioning	<ul style="list-style-type: none">• Complete design and obtain permits in May 2019• Complete utility relocations• Award construction contract and provide Notice to Proceed in July 2019
Tunnel System	<ul style="list-style-type: none">• Issue Request for Qualifications document in August 2019• Finalize EA in April 2019• Formulate and engage the Stakeholder Advisory Group in January 2019• Advance the Request for Proposal documents to a 60 percent level in August 2019• Obtain necessary permits, easements, and agreements
Wet Weather Treatment Facility	<ul style="list-style-type: none">• Conduct full-scale testing of wet weather treatment in the existing primary settling tanks• Summarize bench-scale and full-scale testing in a technical memorandum

We greatly appreciate VDEQ's continued support and assistance as we implement this environmentally beneficial program for Alexandria. Should you have any questions or comments, please contact me directly at (703) 549-3382 ext. 2202 or karen.pallansch@alexrenew.com.

Sincerely,



Karen Pallansch
AlexRenew General Manager

Copy: Douglas Frasier, VPDES/VPA Permit Writer, Senior II, VDEQ
Bryant Thomas, Regional Water Permit & Planning Manager, VDEQ
Emily Baker, Deputy City Manager
Liliana Maldonado, RiverRenew Director
Caitlin Feehan, RiverRenew Program Manager
Jonathan Rak, McGuireWoods LLP

Attachments: A. Outfall Transfer Agreement between AlexRenew and the City of Alexandria (June 2018)
B. Draft RiverRenew Preliminary Engineering Report Executive Summary (October 2018)

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ATTACHMENT A. OUTFALL TRANSFER AGREEMENT BETWEEN ALEXRENEW AND THE CITY OF
ALEXANDRIA (JUNE 2018)

**OUTFALL TRANSFER AGREEMENT BETWEEN THE CITY OF ALEXANDRIA,
VIRGINIA AND THE CITY OF ALEXANDRIA SANITATION AUTHORITY
CONCERNING WET WEATHER WASTEWATER STORAGE AND CONVEYANCE
FACILITIES**

This Outfall Transfer Agreement (“Agreement”) is entered this 1st day of May, 2018 by and between the City of Alexandria, a Virginia municipal corporation (“City”) and the City of Alexandria, Virginia Sanitation Authority, a public body corporate and politic organized under the Virginia Water and Waste Authorities Act, Title 15.2, Chapter 51 of the Virginia Code, doing business as Alexandria Renew Enterprises (“Alexandria Renew”). The City and Alexandria Renew shall be referred to as the “Parties” and individually as “Party.”

RECITALS

- A. Alexandria Renew provides wastewater treatment and conveyance to City residents in accordance with the Sewerage Service Agreement between the City of Alexandria, Virginia Sanitation Authority and the City of Alexandria, Virginia dated 1st day of September, 1954 as amended June 25, 1974 (collectively referred to as the “Service Agreement”). Alexandria Renew owns and operates a treatment plant, interceptor sewers, pump stations and related facilities (referred to herein as the “Authority System” and described as the Sewage Disposal System in the Service Agreement). The City owns and operates both a combined sewer system and a separate sanitary sewer collection system (referred to herein collectively as the “City Collection System” and described as the City System in the Service Agreement).
- B. Alexandria Renew provides wastewater treatment and conveyance to Fairfax County under the Amended and Restated Service Agreement between the City of Alexandria, Virginia Sanitation Authority and the Board of Supervisors of Fairfax County, Virginia dated 1st day of October, 1998. The County owns and operates a separate sanitary sewer collection system.
- C. The Virginia Department of Environmental Quality (“VDEQ”) has issued Virginia Pollutant Discharge Elimination System (“VPDES”) Permit No. VA0087068 to the City (“City VPDES Permit”), including effluent limitations and monitoring requirements, for the City’s Combined Sewer System (“CSS”). This VPDES permit requires the City to develop, periodically update, and implement a Long Term Control Plan (“LTCP”) to reduce combined sewer overflows.
- D. VDEQ has issued VPDES Permit No. VA0025160, including effluent limitations and monitoring requirements, and General Permit Registration No. VAN010059 for the Alexandria Renew Enterprises Water Resources Recovery Facility to Alexandria Renew (“Alexandria Renew VPDES Permit”).

- E. The City submitted a LTCP Update (“LTCPU”), as required by its VPDES permit for the City’s CSS in 2016. Alexandria Renew is developing a plan to address sanitary sewer overflows (“SSOs”) from the Hooffs Run Junction Chamber as required by the Alexandria Renew VPDES Permit. One option for remediation is a combined solution to address (1) the City’s CSO control needs and (2) Alexandria Renew’s need to minimize SSOs caused by wet weather flows from the City’s separate sewer systems and the County’s separate sewer system.
- F. During the 2017 General Assembly a law was enacted accelerating the schedule provided in the Final 2016 LTCPU Report (2017 Va. Acts. Reg. Sess. Ch. 827 (uncodified)) (“2017 CSO Law”). The 2017 CSO Law requires 1) “By July 1, 2023, (the City shall) initiate construction activities necessary to bring the CSO outfalls into compliance; 2) “By July 1, 2025, (the City shall) bring the CSO outfall into compliance with Virginia law, the Federal Clean Water Act, and the Presumption Approach described in the EPA CSO Control Policy, unless a higher level of control is necessary to comply with a TMDL and 3) “The City shall report annually to VDEQ on progress”. In addition, the General Assembly required VDEQ to determine what actions by the City are necessary to attain compliance no later than July 1, 2018.
- G. The Parties agree that a global solution is more efficient and that Alexandria Renew is better suited to finance, design, permit, construct, operate, own and maintain such a solution as further provided herein. To that end, the Parties now wish to transfer the ownership of outfalls 001, 002, 003, and 004, including associated control structures, as shown in Exhibit A (collectively, “Outfalls”) from the City to AlexRenew pursuant to the terms of this Agreement. The Parties further intend that ownership of these Outfalls shall remain with AlexRenew even in the event of relocation. The Parties agree to take whatever action may be required of them to effect AlexRenew’s continuing ownership of all the Outfalls notwithstanding any changes in circumstances such as relocation or sewer system reconfiguration/modification.
- H. Upon the legal transfer of ownership of the Outfalls to Alexandria Renew, the Parties agree to jointly pursue assignment of the CSO VPDES permit responsibility for these outfalls to Alexandria Renew.
- I. The Parties are negotiating an agreement regarding cost share for the West Side Wet Weather Facilities (“WSWWF”) to address excess separate sanitary sewer flows with Fairfax County, Virginia (the “Cost Share Agreement”). The Cost Share Agreement will define the cost allocation between Alexandria and Fairfax County as to the WSWWF; but does not address the (1) financing of the cost-share allocated to Alexandria (“Alexandria Share”) or (2) design, construction, ownership, operation and permitting for the WSWWF.
- J. Alexandria Renew and the City intend to pursue grant funding and any other potential sources of capital for part of the Alexandria Share in order to help control the wastewater rate burdens which the City ratepayers will bear.

THEREFORE, in consideration of these Recitals and the undertakings set forth in this Agreement, the City and Alexandria Renew, each pursuant to due and proper authority, agree as provided herein.

SPECIFIC PROVISIONS

- 1. Responsibility and Ownership.** Upon Closing, as defined below, Alexandria Renew shall become responsible for the financing, design, construction, operation and maintenance, and permitting of the Outfalls in accordance with the implementation schedule approved by VDEQ. Alexandria Renew shall own the Outfalls. Such Ownership and Responsibility includes:
 - a. Alexandria Renew shall be responsible for the design and construction of the LTCPU, including the selection and contracting with one or more general contractors, construction management firms, and any other necessary professionals or craftsmen.
 - b. Alexandria Renew shall be solely responsible for all necessary environmental and other permits and licenses for the construction and operation of the Outfalls, regulatory filings, for required statements and reports, land use approvals, and for utilities for the operation of the Outfalls. Copies of any such permits and licenses and applications therefore, regulatory filings, and statements and reports shall be provided to the City.
 - c. Alexandria Renew shall be solely responsible for the operation and maintenance of the Outfalls and shall be the sole owner of the Outfalls. Alexandria Renew shall operate and maintain the Outfalls in accordance with the VPDES permit, as it may be amended from time to time. Alexandria Renew and the City shall share with each other drafts and final Standard Operating Procedures ("SOPs") relating to the CSS and Outfalls.

- 2. Closing.** Closing under this Agreement (the "Closing") shall be made on the date which is ten (10) days following the satisfaction of all conditions precedent to Closing described below or upon such other date as mutually agreed (the "Closing Date"). At Closing, the City will convey the Outfalls to Alexandria Renew by Special Warranty Deed.

- 3. Conditions Precedent to Closing.** The City and Alexandria Renew agree that the obligation of Alexandria Renew to acquire the Outfalls and to finance, design, construct, operate, maintain, and permit the LTCPU is subject to the satisfaction, as of the Closing Date, of each of the following conditions precedent:
 - a. Execution of an amended and restated Service Agreement between the City and Alexandria Renew.
 - b. Execution of an agreement between the City and Alexandria Renew allocating obligations for the Nine Minimum Controls required for the CSS ("NMC Agreement").

- c. Approval of an amendment to the Charter for Alexandria Renew to clarify that CSO Management is authorized and to extend the time of expiration of the Charter until 2068.
- d. Transfer of the existing permit or a reissued permit for the CSS based on the LTCPU, including both parties supporting any necessary transfer of the CSO-related waste load allocation from the Chesapeake Bay TMDL.
- e. Approval by the Planning Commission pursuant to Section 9.06 of the City Charter.
- f. Approval of the transfer of ownership by the City Council.
- g. Approval of the transfer of ownership by the Alexandria Renew Board, if required.

Alexandria Renew and the City may agree to waive any of the foregoing conditions precedent not required by law and proceed to closing.

- 4. **VPDES Permitting.** The City and Alexandria Renew will petition VDEQ to transfer the City's VPDES permit to Alexandria Renew pursuant to section Y. of the City VPDES Permit. The Parties will support this transfer and, if required, provide their written consent. The City will coordinate a phased transfer of compliance responsibilities to Alexandria Renew such that all compliance related activities are transferred by permit reissuance anticipated in August 2018.
- 5. **Compliance with CSO Law**
 - a. Following the Closing Date, Alexandria Renew will be responsible for compliance with the CSO Law in all respects including but not limited to providing the annual progress report to VDEQ for the Outfalls and constructing the LTCPU on a schedule as needed to meet the requirements of the CSO Law as it may be amended.
 - b. The City and Alexandria Renew will coordinate and cooperate regarding any proposed amendments to the CSO Law.
- 6. **Development Approval Process.** The Parties agree that the conveyance of the Outfalls to Alexandria Renew from the City will not change the current process established between the Parties for approval of new development, including development connecting to the CSS, except as required by the NMC Agreement or by future EPA or VDEQ regulatory requirements.
- 7. **Pre-Planning and Design.** Nothing herein shall be interpreted to prevent Alexandria Renew from initiating planning, design, and other preliminary work for the LTCPU prior to the Closing Date. Expenditures on the LTCPU by Alexandria Renew prior to VDEQ approval may qualify for reimbursement pursuant to the Cost Share Agreement.
- 8. **Financing.** Alexandria Renew shall be solely responsible for financing the Alexandria Share of the costs to design, build, permit and operate the LTCPU. Both parties recognize that Alexandria Renew's source of funds for this obligation are rates, fees and charges paid by Alexandria Renew's customers located in the City of Alexandria.

Alexandria Renew has authority pursuant to the Virginia Water and Waste Authorities Act to adjust its rates, fees and charges as necessary to pay the Alexandria Share. The sources of funding, terms, closing and other aspects thereof shall be solely the responsibility of Alexandria Renew and it shall be the sole obligated party to any lender(s) or bondholder(s). If the City obtains any funds for this project through Federal or State funding, the City will work with Alexandria Renew and the applicable agencies to have the funding transferred to Alexandria Renew for the Project.

9. **Design.** Alexandria Renew shall be responsible for the selection of and contracting with engineers and other professionals to design the LTCPU, as well as for their supervision and interactions therewith throughout the design process. To the extent the City has obtained or will obtain studies and reports related to the design of the LTCPU or other related projects, such as environmental or geotechnical investigations, the City will provide copies of such studies and reports to Alexandria Renew and its design professionals.
10. **Regulatory Review by City.** The City will review and approve or disapprove the construction proposed for the LTCPU in accordance with the requirements of the Zoning Ordinance, the City Code, the Virginia Uniform Statewide Building Code and all other applicable City laws and regulations (“City Laws”). Alexandria Renew shall provide to the City for review the plans and specifications for the LTCPU in sufficient detail to comply with City Laws, and shall provide such drafts for review as they are available. The City will use its best efforts, consistent with all applicable laws, to expedite the regulatory review and approval of the design and construction. In order to facilitate the expedited approval of plans for the LTCPU, the City will participate in the Regulatory Team approach described in Section 11(a) below to assist Alexandria Renew in developing plans that meet the requirements of all City ordinances.
11. **Project Team Approach.** In recognition of the partnership between the City and Alexandria Renew to deliver this project in compliance with the CSO Law, the Parties will utilize a “Project Team” approach which will consist of:
 - a. **City Regulatory Team:** The City will prioritize regulatory reviews and approvals required for the LTCPU project to support the delivery time lines. To facilitate the regulatory review, the City will establish a team made up of representatives from each department tasked with any part of the regulatory review of the construction proposed for the LTCPU to serve as a workgroup to review and discuss all technical aspects of the LTCPU project that require approval pursuant to City Laws. A City team leader will be designated to be a point of contact for Alexandria Renew to resolve any questions about compliance with the regulatory requirements. The Regulatory Team will meet on a regular basis as determined by the team and at the request of either party if needed. Alexandria Renew will provide the City Regulatory Team with any information about the project needed for regulatory review that the City Regulatory Team may request within a reasonable time of the request.

- b. *Alexandria Renew Project Coordination Working Meetings.* Alexandria Renew will coordinate with the City through the project development and implementation. To facilitate such coordination, representatives from City staff chosen by the City and familiar with the program will attend the Alexandria Renew Project Coordination Working Meetings on topics related to the LTCPU Project development and implementation. Alexandria Renew is solely responsible for the timing and content of these meetings. The timing and content of these meetings will evolve as the program continues to meet the needs of the Alexandria Renew program team. Consistency in City staff attendance is important for optimum coordination and efficiency.
 - c. *City Council-Alexandria Renew CSO Project Review Workgroup.* In order to facilitate the team approach throughout the organizations and to provide a liaison for input and feedback from the City, the City Council and the Alexandria Renew Board will each designate two members of their boards to serve on a joint workgroup to review and guide the plans, designs, implementation, costs and financing to minimize community impacts and maximize overall community benefits (“Project Review Workgroup”). The Project Review Workgroup will be supported by designated core staff from each entity and shall meet as determined necessary by the members of the workgroup.
 - d. *Fees.* Both parties agree not to charge the other for any review, permitting, discharge and all other fees, that would normally be charged to the other party during the planning, design and construction of all projects directly related to the LTCPU facilities for the four Outfalls.
12. **Public Outreach and Community Relations.** Alexandria Renew shall conduct public outreach and community relations and in coordination with the City, will develop an overall outreach strategy and communications plan in accordance with principles of the City of Alexandria What’s Next Alexandria Handbook for Civic Engagement. Such outreach strategy and communication plan shall include regular meetings with all outreach groups as deemed necessary to facilitate project outcomes.
13. **Land Acquisition; Condemnation.** To the extent condemnation is necessary to construct and/or operate the LTCPU, the City agrees to assist Alexandria Renew in any condemnation action initiated by Alexandria Renew, provided, however, Alexandria Renew will be responsible for all costs of acquisition of the property including payment of the Alexandria share of compensation to the landowner.
14. **Access to City Property.** During the planning, design, and construction of the LTCPU facilities it may become apparent that access to property owned by the City may be necessary in order to facilitate the LTCPU project. Alexandria Renew will inform City staff and the Project Review Work group if it will request access to City-owned property as soon as reasonable. As these needs arise, the City will consider each request weighing the needs of the LTCPU project against the current use of the particular property by the City, will seek City Council authorization if needed, and will consider what, if any,

compensation would be required to the City for the use of the property.

15. **Secondary Benefits.** By January 31st of each succeeding year following operation of the LTCPU upgrade, Alexandria Renew will apply the Chesapeake Bay TMDL Watershed Implementation Plan Alexandria CSO allocations in effect at that time for nitrogen, phosphorus and sediment to any CSS overflows and to the measured captured and treated combined flows through the Alexandria Renew treatment plant. If after this analysis, allocation of nitrogen, phosphorus and sediment remains unapplied, such credits will be calculated using Alexandria Renew's actual previous year annual reported nitrogen, phosphorus and sediment performance and traded to the City for its use.
16. **Continuation of Outfalls.** The Outfalls provide an important flood control function for the City and protect both the Authority System and the City Collection System. Once Alexandria Renew obtains ownership of the Outfalls pursuant to this Agreement, it agrees to maintain those Outfalls indefinitely unless the City and Alexandria Renew agree in writing to the closure or relocation of such outfalls.

GENERAL PROVISIONS

17. **No Partnership.** Nothing contained in this Agreement, and no action taken or omitted pursuant to this Agreement shall create any partnership entity, joint venture, or association. No rights are provided to third parties.
18. **Dispute Resolution.** The Parties agree to informally, and in good faith, pursue resolution of any dispute arising out of this Agreement within 15 days of one Party notifying the other in writing of an informal dispute. If necessary, the Parties shall submit such dispute to formal non-binding mediation, which shall culminate no later than 90 days after one Party notifies the other in writing of a formal dispute. Such deadline may be extended by mutual agreement of the Parties. Any formal dispute arising out of this Agreement which is not resolved by such mediation may be submitted for resolution by a court of competent jurisdiction of the Commonwealth of Virginia.
19. **Partial Invalidity.** If any provisions of this Agreement are found to be void or otherwise unenforceable by a court of competent jurisdiction, the remaining provisions shall be unaffected and shall remain in full force and effect.
20. **Parties' Representations.** The Parties represent that they have the authority to enter into this Agreement, that its execution does not violate any legal requirement to which it is subject, and that the individuals signing this Agreement on their behalf have been granted the requisite power and authority by public resolution in a duly advertised public meeting to bind the Party on whose behalf they sign to its provisions.
21. **Binding Effect.** This Agreement shall apply to and shall be binding upon the Parties hereto, as well as their elected officials, appointees, officers, directors, employees, agents,

successors, and assigns, and to the extent permitted by applicable law all persons whether natural or corporate acting under, through or for them.

22. **Entire Agreement.** This Agreement constitutes the entire agreement between the Parties with respect to the matters addressed herein.
23. **No Modification of Service Agreement.** This Agreement shall complement, and is intended to not conflict with the Service Agreement. Nothing in this Agreement shall be interpreted to modify or amend the Service Agreement.
24. **Modification; Waiver.** No modification, termination, or waiver of any provision of this Agreement shall be binding upon a Party unless in writing and signed by the Party against whom enforcement is sought. All Parties have participated in the preparation of this Agreement and have received advice of legal counsel; and this Agreement shall not be construed against any Party based on the identity of the drafter of this Agreement.
25. **Applicable Law.** This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Virginia.
26. **No Assignment.** Neither Party may assign this Agreement without the express written consent of the other Party.
27. **Non-Merger.** Notwithstanding any other terms of this Agreement, the provisions of this Agreement shall survive Closing hereunder and shall not be merged into the Special Warranty Deed.
28. **Term.** The term of this Agreement shall begin on the date first stated above, and shall run until terminated by the Parties.
29. **Rights and Remedies.** The terms and conditions of this Agreement may be enforced as a contract by specific performance by either Party hereto. All rights and remedies available to the Parties at law and equity in accordance with the laws of the Commonwealth of Virginia are preserved.
30. **Other Documents.** The Parties recognize the potential need for such other documents, instruments, applications and other writings necessary for the implementation of this Agreement, and the Parties agree to execute and deliver such further items in reasonable form as may be needed.
31. **Compliance with Law.** In implementing their respective responsibilities under this Agreement, the Parties shall comply with applicable laws.
32. **Counterparts.** This Agreement may be executed in counterparts, each of which shall be deemed an original, and all of which shall constitute but one and the same instrument.
33. **Headings.** Any headings of the paragraphs or other portions of this Agreement are for convenience of reference only, and shall not affect the meaning or construction of any provision hereunder.

34. Notices. All notices or other communications required or permitted under this Agreement shall be in writing directed to a Party at its address set forth below. A Party may designate a new address by written notice to the other Party. All notices shall be effective and be deemed delivered upon receipt as evidenced by a signed certified mail receipt, signed overnight delivery receipt, or signed acceptance of hand delivery receipt.

City of Alexandria

**Attn: Director, Transportation and Environmental Services
301 King St.
Alexandria, VA 22314**

With a copy to:

**Alexandria City Attorney
301 King St., Room 1300
Alexandria, VA 22314**

Alexandria Renew Enterprises

**Attn: Chief Executive Officer
1800 Limerick Street
Alexandria, VA 22314**

With a copy to:

**Jonathan Rak
McGuireWoods LLP
1750 Tysons Boulevard, Suite 1800
Tysons Corner, VA 22102-4215**

Signatures Appear on the Following Pages

Agreed and Approved: City of Alexandria

By: 

Printed Name: Mark B. Jinks

Title: City Manager

Date: 5-1-18

Approved as to form:

By: 
Deputy City Attorney

Date: April 30, 2018

Agreed and Approved: Alexandria Renew Enterprises

By: 

Printed Name: Karen Pallansch

Title: Executive Director

Date: 4.30.18

Approved as to form:

By: 

Date: 4/30/18



1 inch = 25 feet

CSO-001






Pendleton St
Combined Sewer
(City)

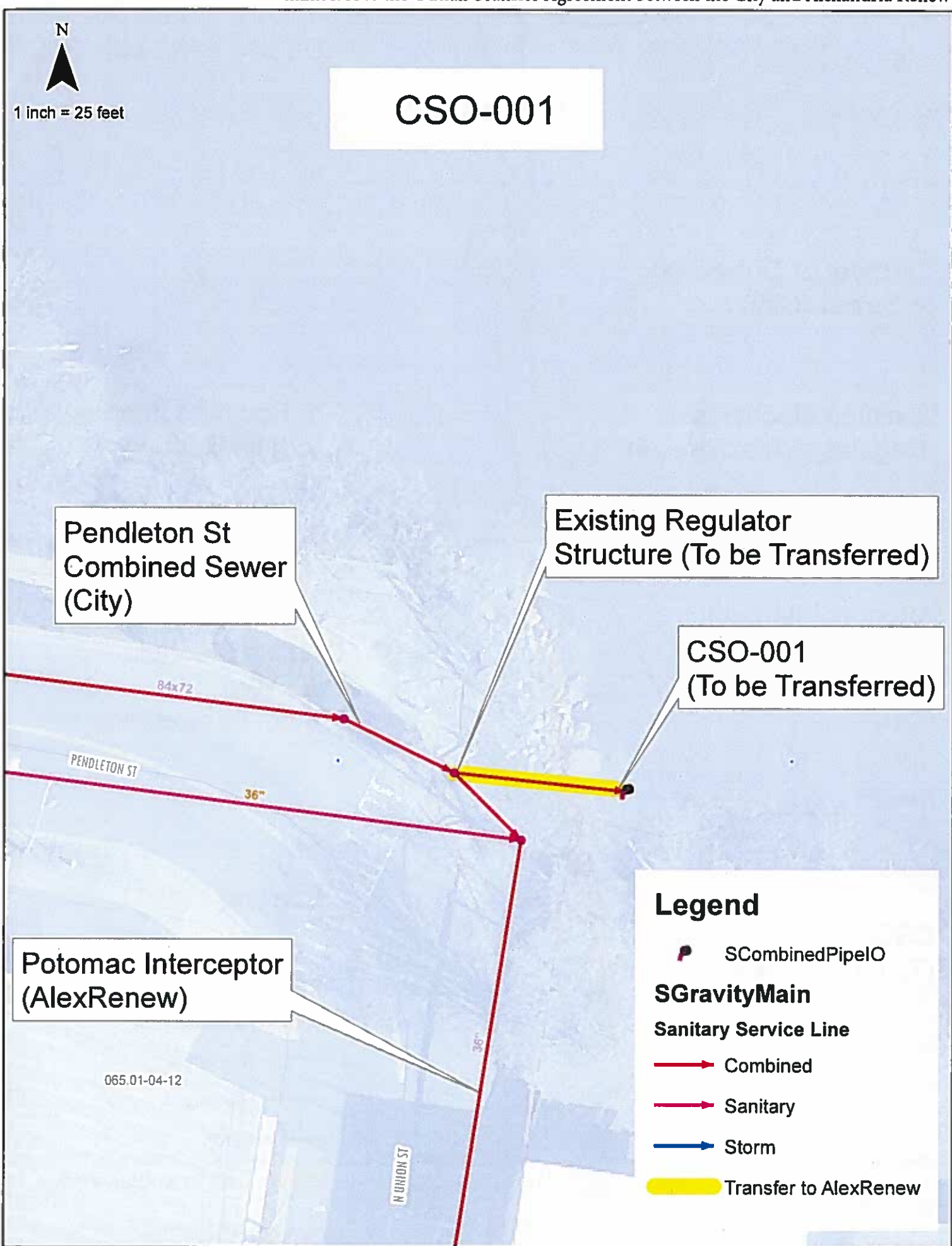
Existing Regulator
Structure (To be Transferred)

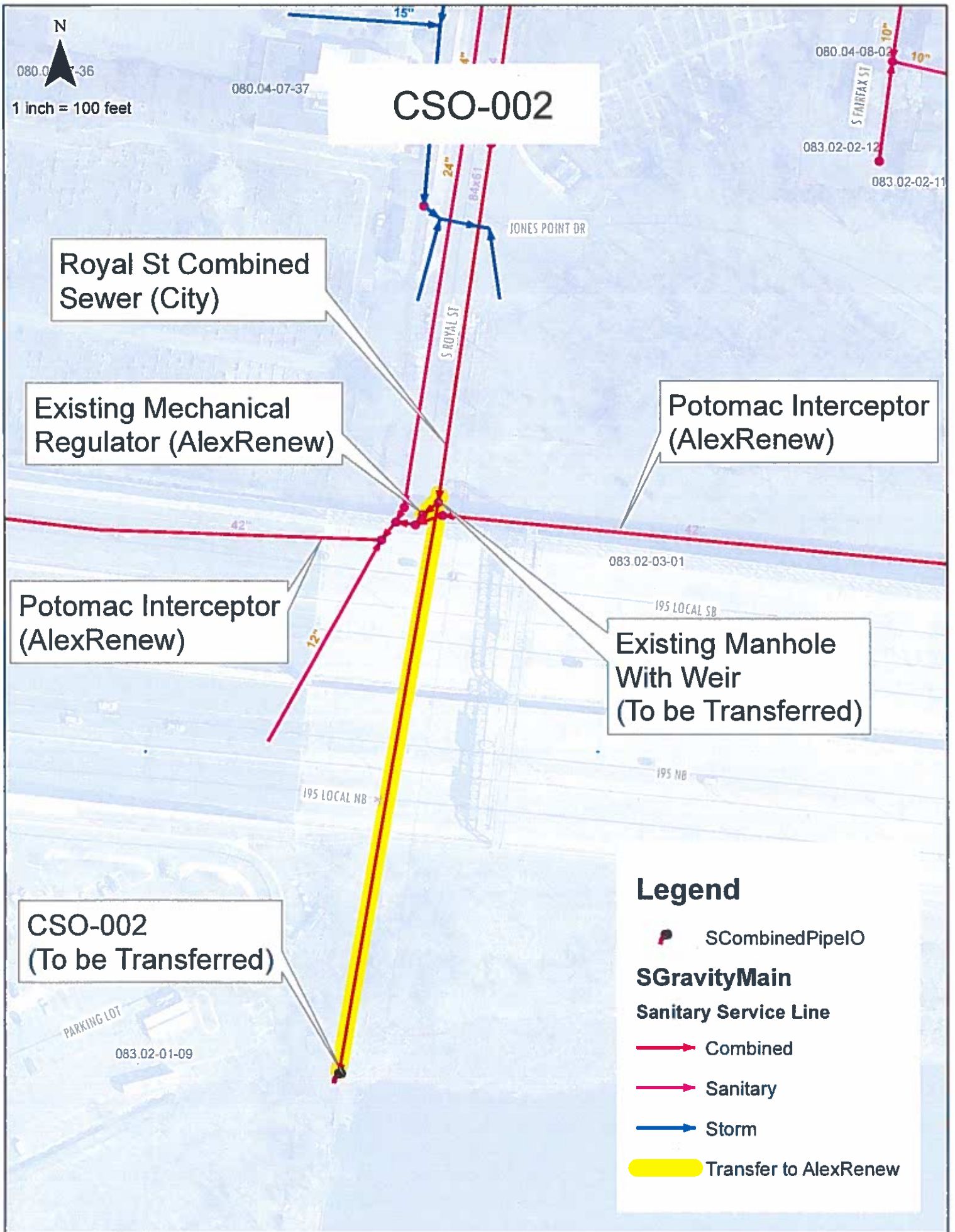
CSO-001
(To be Transferred)

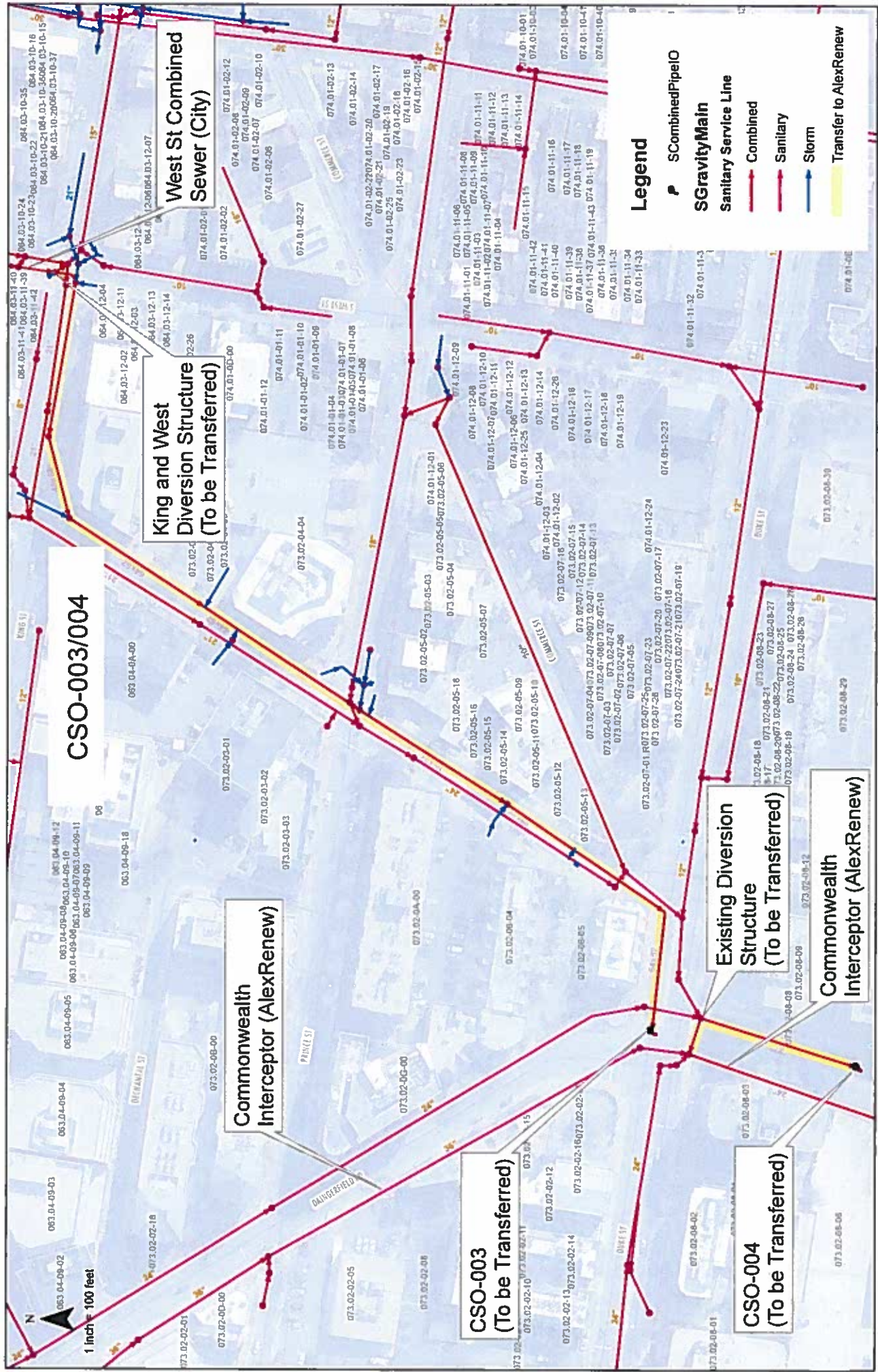
Potomac Interceptor
(AlexRenew)

Legend

-  SCombinedPipeIO
- SGravityMain**
- Sanitary Service Line**
-  Combined
-  Sanitary
-  Storm
-  Transfer to AlexRenew







CSO-003/004

West St Combined Sewer (City)

King and West Diversion Structure (To be Transferred)

Commonwealth Interceptor (AlexRenew)

Existing Diversion Structure (To be Transferred)

Commonwealth Interceptor (AlexRenew)

CSO-003 (To be Transferred)

CSO-004 (To be Transferred)

Legend

- S Combined Pipe/O
- S Gravity Main
- Sanitary Service Line
- Combined
- Sanitary
- Storm
- Transfer to AlexRenew

1 inch = 100 feet



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ATTACHEMENT B. DRAFT RIVERRENEW PRELIMINARY ENGINEERING REPORT EXECUTIVE SUMMARY
(OCTOBER 2018)

Executive Summary

ES.1 Purpose of the Preliminary Engineering Report

The purpose of the RiverRenew Preliminary Engineering Report (PER) is to develop and analyze alternatives for the design and construction of the recommended plan established as part of the 2018 Combined Sewer System Long Term Control Plan Update (LTCPU). The LTCPU, approved by the Virginia Department of Environmental Quality in June 2018, recommended a unified tunnel system coupled with wet weather treatment to meet the performance requirements of the 2017 CSO Law. The configuration of unified tunnel system is illustrated in Figure ES-1. Generally, it includes a storage/conveyance tunnel to address the requirements for Outfalls 001 and 002 and a conveyance tunnel/pipeline to address the requirements associated with Outfalls 003 and 004. In order to meet the stringent regulatory requirements, the tunnel system is coupled with improvements at Alexandria Renew Enterprises' (AlexRenew) Water Resource Recovery Facility (WRRF) that include the expansion of AlexRenew's primary treatment capacity from 108 to 116 MGD, the relocation of facilities and decommissioning of AlexRenew's former administrative building, and modifications to the primary treatment systems to provide disinfection of wet weather flows.

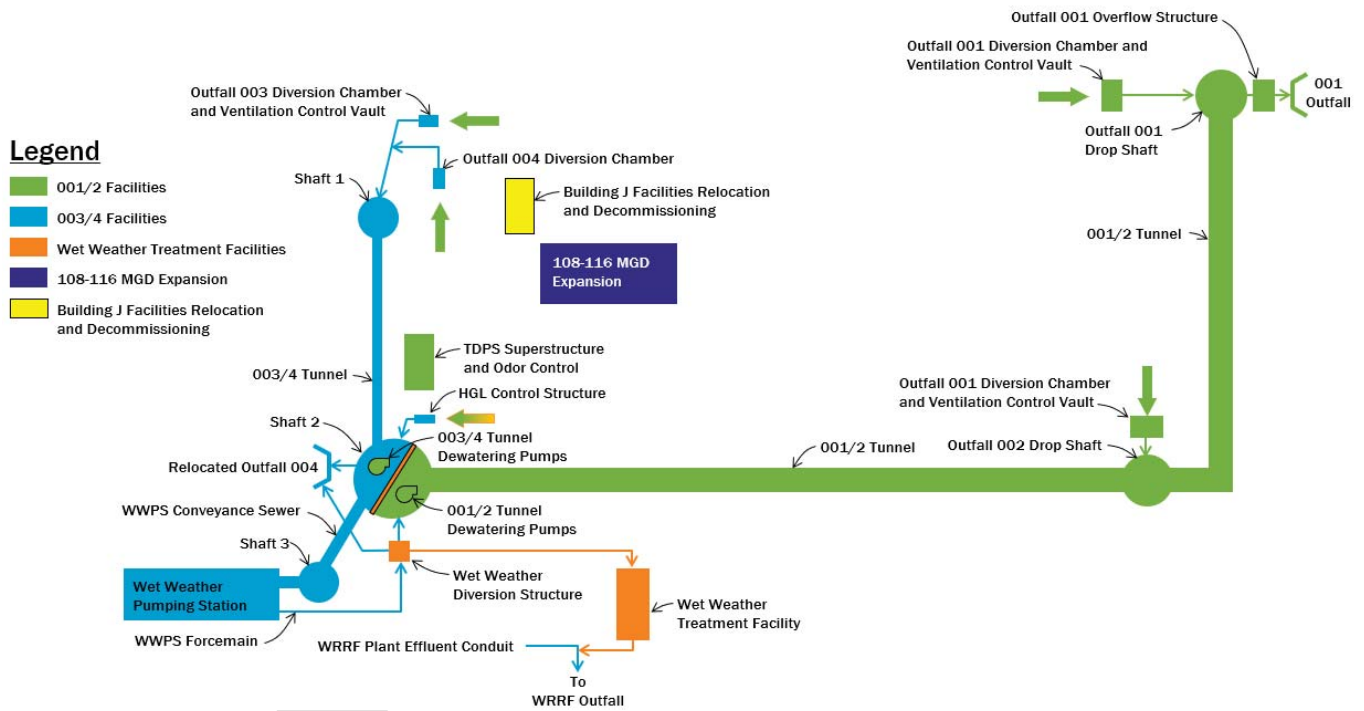


Figure ES-1. Schematic of Diversion Sewers to 001/2 Tunnel

ES.2 Alternatives Studied as Part of the PER

In order to advance the concept established in the LTCPU, the PER analyzed various alternatives to meet the regulatory requirements associated with Outfalls 001-004. These alternatives are summarized in Table ES-1 and generally illustrated in Figure 3-3.

Table ES-1. Alternatives Analyzed for 001/2 System

Tunnel Alignment	Tunnel Diameter (ft)	Tunnel Length (ft)	Outfall 001 Diversion Facility Location	Outfall 002 Diversion Facility Location
Potomac-Church	12	11,436	Robinson Terminal North	South Royal
		11,619	Oronoco East	South Royal
		12,027	Oronoco North	South Royal
Union-Church	12	10,998	Oronoco East	South Royal
Lee-Church	12	10,774	Oronoco West	South Royal
Potomac-Green	12	11,037	Robinson Terminal North	Green Street
		11,229	Oronoco East	Green Street
		11,628	Oronoco North	Green Street
Union- Green	12	10,438	Oronoco East	Green Street
Lee-Green	12	10,126	Oronoco West	Green Street

Generally, the 001/2 tunnel alternatives include two main east west tunnel branches, along Church or Green Streets, and three north south branches along the Potomac River, Union Street, and Lee Street. Four proposed surface facility alternatives were studied at Outfall 001, while two proposed surface facility alternatives were analyzed at Outfall 002.

The 003/4 alignment alternatives primarily consist of an evaluation of three approaches to connect Outfalls 003 and 004 to the WRRF that includes deep tunnel construction, trenchless diversion sewer construction, and traditional open-cut construction. Each of these alternatives are illustrated in Figure 3-3.

Table ES-2. Alternatives Analyzed for 003/4 System

Alternative	Tunnel Diameter (ft)	Tunnel Length (ft)	Depth (ft)	Shaft Needed at Duke/Daingerfield?	Means and Methods of Construction
Deep Tunnel	12	2,648	120-130	Yes	Earth pressure balance tunnel boring machine with precast segmental liner
Holland Lane Diversion Sewer	6	3,386	20-40	No	Trenchless
Hooffs Run Diversion Sewer	6	2,458	10-20	No	Open-cut

In addition to the 001/2 and 003/4 systems, various alternatives were also evaluated to relocate facilities from and decommission AlexRenew’s former administration building, also known as Building J. The demolition of Building J is required to provide sufficient construction staging area to build the mining shaft, 001/2 tunnel, tunnel dewatering pumping station and associated appurtenances.

Each of the alternatives analyzed for the Building J relocation are presented below in Table ES-3.

Table ES-3. Alternatives Analyzed for Building J Relocation

Alternative	Location
Alternative 1	Building F Expansion
Alternative 2	New Building East of A
Alternative 3	New Building East of A + Building F
Alternative 4	New Building by TDPS Building
Alternative 5	Building G/2

DRAFT

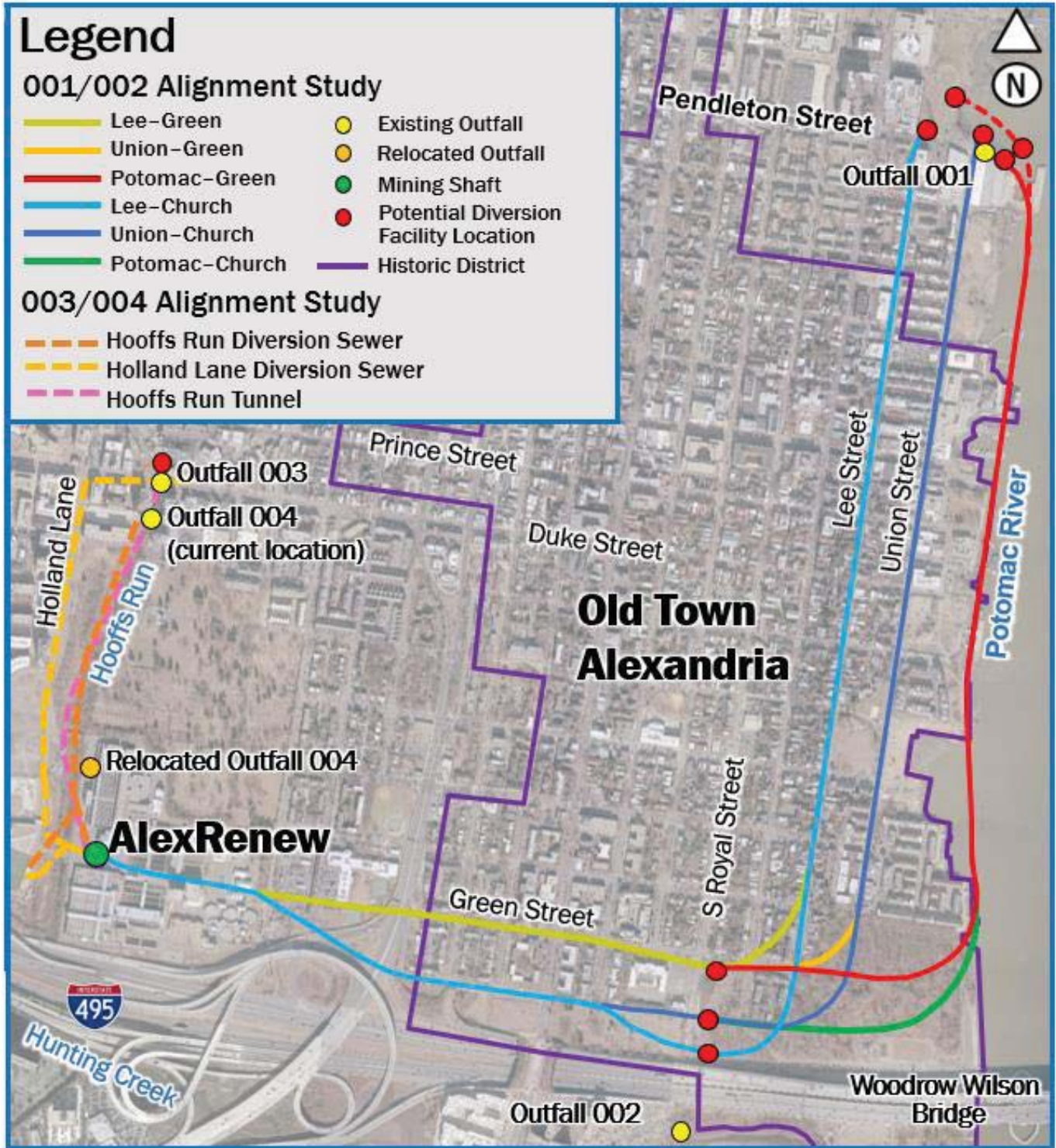


Figure ES-2. Alternatives Analyzed for the PER

ES.3 Evaluation of Alternatives

While all identified alternatives will achieve the required degree of performance, the relative merits of each were evaluated with respect to the following criteria:

- Property Acquisition and Permits: Locate new facilities within public land and rights-of-way, where feasible.
- Community and Environmental Impacts: Avoid or minimize potential impacts on the community and cultural and environmental resources.
- Constructability: Facilitate constructability of the facilities, including the provision of sufficient space to stage the construction of the tunnels and surface features.
- Cost: Minimize overall program cost.
- Operations and Maintenance: Complexity in maintaining and operating the permanent facilities. Note: there was no major difference in operations and maintenance for the 001/2 system, so this criteria was evaluated only for the proposed 003/4 alternatives.

The process to select a technically preferred alternative includes the (1) development of alternatives that achieve the required LTCPU performance; (2) evaluation of non-monetary considerations to understand each alternative's relative merit; (3) estimation of costs for each alternative; (4) comparison of advantages and disadvantages of the alternatives; and (5) justification and documentation of the technically preferred alternative.

Table ES-4 and Table ES-5 provide summaries of the proposed 001/2 and 003/4 facilities in terms of favorability.

Table ES-4. 001/2 Alignment Evaluation Summary

Tunnel Alignment	Outfall 001 Diversion Facility Location	Outfall 002 Diversion Facility Location	Property Acquisition and Permits	Community and Environmental Impacts	Constructability	Cost
Potomac-Church	Robinson Terminal North	Royal Street	Requires easement from Ford’s Landing and Robinson Terminal	Minimizes risk of community impact – farthest away	Provides constructible radius of curvature	+2.1%
	Oronoco East	Royal Street	Requires temporary easement in Oronoco Bay Park	Permanent impact to Oronoco Bay Park	Provides constructible radius of curvature	+1.9%
	Oronoco North	Royal Street	Requires temporary easement in Oronoco Bay Park	Permanent impact to Oronoco Bay Park	Provides constructible radius of curvature	+5.1%
Union-Church	Oronoco East	Royal Street	Requires temporary easement in Oronoco Bay Park	Permanent impact to Oronoco Bay Park	Provides constructible radius of curvature	+2.5%
Lee-Church	Oronoco West	Royal Street	Requires temporary easement in Oronoco Bay Park	High risk of community impact	Diversion facility construction in close proximity to residential building	+6.2%
Potomac-Green	Robinson Terminal North	Green Street	Requires easement from Ford’s Landing and Robinson Terminal	Construction activities impact St Mary’s School and community Garden	Small construction staging area at 002 diversion facility location	+1.0%
	Oronoco East	Green Street	Requires temporary easement in Oronoco Bay Park	Construction activities impact St Mary’s School and community Garden	Small construction staging area at 002 diversion facility location	+0.0%
	Oronoco North	Green Street	Requires temporary easement in Oronoco Bay Park	Construction activities impact St Mary’s School and community Garden	Small construction staging area at 002 diversion facility location	0.7%
Union-Green	Oronoco East	Green Street	Requires temporary easement in Oronoco Bay Park	Construction activities impact St Mary’s School and community Garden	Small construction staging area at 002 diversion facility location	+0.0%
Lee-Green	Oronoco West	Green Street	Requires temporary easement in Oronoco Bay Park	Construction activities impact St Mary’s School and community Garden	Diversion facility construction in close proximity to residential building	+0.0%

The Potomac-Church alignment with the Outfall 001 Diversion Facility Drop Shaft located at Robinson Terminal North and the Outfall 002 Diversion Facility located at Royal Street is considered the most favorable alternative to be further evaluated for the next phase of design development for the 001/2 system. The primary factors affecting this decision include the constructability of the alignment, reduced risk of community impacts during and after construction, and an estimated cost that is within 2.1% of the lowest cost alternative.

Table ES-5. 03/4 Alignment Evaluation Summary

Alignment	Property Acquisition and Permits	Community and Environmental Impacts	Constructability	Operations and Maintenance	Cost
Deep Tunnel	Property acquisition required for shaft site	High impact to business and traffic	Highest construction duration – on critical path	Permanent ventilation control facility at 1501 Duke Street	+38.9%
Holland Lane Diversion Sewer	Low requirements for temporary and permanent easements	High impact to business and traffic	Construction activities within major local thoroughfares	Minimal O&M requirements	+0.0%
Hooffs Run Diversion Sewer	No permanent easements required	Possible archaeological and wetland impacts	Shortest construction duration	Minimal O&M Requirements and maximizes flow to the plant	+0.8%

The Hooffs Run Diversion Sewer is considered the most favorable alternative to be further evaluated for the next phase of design development for the 003/4 system. The primary factors affecting this decision include reduced construction schedule risk, reduced risk of community impacts, and a cost that is within 0.8% of the lowest cost alternative.

Table ES-6. Building J Facilities Relocation and Decommissioning Evaluation Summary

Alternative	Future land use	Permitting	Consolidated Spaces	Proximity to AlexRenew Environmental Center	Constructability	WRRF Impact
Building F Expansion	Preserves future expansion of Building A	Subject to DSUP process	Yes	Not close to the Environmental Center	Construction start date tied to PAC Blower upgrades	May impact plant operations
New Building East of A	Constrains future expansion of Building A	Subject to DSUP process	Yes	Not close to the Environmental Center	Requires privatization of S. Payne St	Requires shorter duration of interim laboratory use
New Building East of A and F	Constrains future expansion of Building A and F	Subject to DSUP process	No	Not close to the Environmental Center	Construction start date tied to PAC Blower upgrades	Requires shorter duration of interim laboratory use
New Building by TDPS	Preserves future expansion of Building A and F	Subject to DSUP process	Yes	Close to the Environmental Center	Construction start date tied to new TDPS building	Requires a long duration of interim laboratory use
Building G/2	Preserves future expansion of Building A and F	Subject to DSUP process	Yes	Not close to the Environmental Center	Construction is independent of other projects	Requires shorter duration of interim laboratory use

The technically preferred alternative for the Building J Relocation is to relocate Building J facility functions to the first floor of Building G/2. The primary factors affecting this decision include the preservation of future expansion at the WRRF, independence of construction activities from other RiverRenew projects, and a shorter time period in which an interim laboratory would be required.

Wet Weather Treatment

The approved LTCPU included a dual-use wet weather treatment facility to further reduce the volume and frequency of discharges from Outfall 001. Since the LTCPU analyzed various approaches for wet weather treatment at AlexRenew and selected the dual-use alternative, this PER serves to document the process that went into selecting the dual-use alternative

WRRF Plant Expansion

As outlined in the approved LTCPU, AlexRenew will execute a project to increase the peak flow capacity of the Primary Effluent Pump Station (PEPS), located in the basement of the Solids Processing Building (L). The 108 to 106 MGD increase in the influent peak capacity at AlexRenew's WRRF is part of the overall RiverRenew strategy to reduce the number of overflow events and volume during peak storm events.

ES.4 RiverRenew Technically Preferred Alternative

Table ES-7 summarizes the technically preferred alternative for each RiverRenew component based on the facilities evaluation conducted as part of this PER.

It should be noted that due to the accelerated timeline required to comply with the schedule mandated by the 2017 Virginia Law, the PER is being developed concurrently with the RiverRenew Environmental Assessment (EA). The EA is required to comply with the National Environmental Policy Act of 1969 since portions of the program require permits and approvals from the National Park Service to potentially construct within property under their ownership. Development of the EA requires significant community outreach in order to receive feedback to make an informed decision on a preferred alternative. This process for RiverRenew began in September 2018 and is estimated to be finalized in Spring 2019.

Chapter 790, Section 940 of the Virginia Administrative Code requires PERs to identify a "selected alternative." In order to maintain the integrity of the EA process and the feedback received from the community, this PER will not identify a selected alternative, but will recommend a technically preferred alternative based on engineering judgement, cost, and schedule. The EA will continue to further study the environmental and community impacts for all alternatives identified in the PER and will conclude with a decision document recommending a preferred alternative. This PER may be updated at a later date to reflect the findings of the EA and its decision document. Under no circumstances does the PER preempt the EA or its process. Therefore, until the EA is complete, any recommendation will be solely technical in nature and referred to as the "technically preferred alternative."

Table ES-7. Summary of Technically Preferred RiverRenew Facilities

RiverRenew Component	Technically Preferred Alternative	Reason
001/2 Tunnel	Potomac-Church	Minimizes risk during construction
Outfall 001 Diversion Facility	Robinson Terminal North	Minimizes short- and long-term community impacts
Outfall 002 Diversion Facility	South Royal Street	Minimizes short- and long-term community impacts
003/4 System	Hooffs Run Diversion Sewer	Minimizes community impacts Can be constructed concurrently with the 001/2 tunnel Provides a public benefit via stream restoration
Building J Facilities Relocation and Decommissioning	Building G/2 Alternative	Maximizes future expansion at the WRRF
Wet Weather Treatment Facility	Dual-use Wet Weather Treatment Facility	Uses existing WRRF facilities 4 to 5 times cheaper than alternatives
WRRF Upgrades	108-116 MGD Expansion	Increases hydraulic capacity at the WRRF to reduce flow backups and overflows

ES.5 Performance of Technically Preferred Alternative

Table ES-8 shows the expected bacteria loadings from each outfall following implementation of the RiverRenew technically preferred alternative for the Hunting Creek TMDL climate years of 2004 and 2005. As illustrated in the table, the anticipated aggregated CSO bacteria loadings following the program’s implementation are less than the aggregated CSO total waste load allocation of 6.42E+13 cfu/yr. Therefore, the preferred RiverRenew facilities comply with Hunting Creek TMDL waste load allocations. The WRRF growth allocation will serve as a safety factor to the aggregated CSO waste load allocation or will be used for future growth.

Table ES-8. RiverRenew Facilities Comply with Hunting Creek TMDL

Outfall	RiverRenew Bacteria Loading (cfu/yr)		Hunting Creek TMDL Waste Load Allocation (cfu/yr)
	2004	2005	
002	2.77E+13	5.12E+13	6.26E+13
003	2.50E+11	0.00E+00	7.68E+11
004	5.00E+09	4.93E+12	8.52E+11
Wet Weather Treatment	2.76E+12	7.26E+12	-
Aggregated CSO Total	3.07E+13	6.33E+13	6.42E+13
WRRF Growth Allocation			2.10E+13
Aggregated CSO and WRRF Growth Total			8.52E+13

The RiverRenew facilities are predicted to limit overflows to less than 4 events per year based on the average of the modeled 2000 to 2016 climate period, which complies with EPA CSO Control Policy’s Presumption Approach. Table ES-9 provides a comparison of the number of overflows and the volume of overflows before and after the implementation of the preferred RiverRenew facilities.

Table ES-9. Average Number and Volume of Overflows per Year for Climate Period between 2000-2016

Outfall	Average No. of Overflows		Average Overflow Volume	
	Existing	After Implementation	Existing	After Implementation
001	34.1	2.3	63	8
002	78.4	1.8	38	5
003	60.4	1.6	31	1
004	71.4	<1	8	2
Total			140	16

ES.6 Estimated Cost of Technically Preferred Alternative

The opinion of probable construction cost (OPCC) estimate for the RiverRenew technically preferred alternative with a comparison to the LTCPU estimate is summarized in Table ES-10. The RiverRenew facilities are currently designed to an approximately 10% level of definition. In accordance with the Association for the Advancement of Cost Engineering International (AACE) criteria, the OPC has been developed as a Class 4 estimate. Expected accuracy for Class 4 estimates typically range from -30 to +50 percent.

Major changes affecting program cost since the LTCPU include:

- Increased length of the 001/2 tunnel by approximately 2,000 feet
- 003/4 facilities changed from a deep tunnel to a conventional open-cut diversion sewer
- Advanced design and developed further definition for tunnel dewatering pumping station and wet weather treatment
- Added new scope to relocate existing facilities from Building J and demolish the building to provide sufficient staging area to construct the proposed tunnel system

Table ES-10. Capital Cost Comparison of RiverRenew to LTCPU Estimates

Major Component	LTCPU Estimate	DRAFT PER Estimate	% Change from LTCPU
001/2 Facilities	\$ 155 M	\$ 182 M	17%
003/4 Facilities	\$ 97 M	\$ 52 M	(46%)
Tunnel Dewatering Pumping Station and Shaft	\$ 45 M	\$ 75 M	67%
108-116 MGD Expansion	\$ 3 M	\$ 3 M	0%
Wet Weather Treatment Facility	\$ 5 M	\$ 2 M	(62%)
Totals	\$ 304 M	\$ 314 M	3%
New Scope:			
Building J Facilities Relocation and Decommissioning	-	\$ 19 M	100%
Grand Totals	\$ 304 M	\$ 333 M	9%

ES.7 RiverRenew Project Packaging and Schedule

RiverRenew will be executed through four major projects that include the 108-116 MGD Expansion, Building J Facilities Relocation and Decommissioning, Tunnel System, and Wet Weather Treatment Facility. Generally, construction will start in 2019 and last through 2025 as illustrated in the overall program schedule provided as Figure ES-3. All projects will be procured via traditional design-bid-build methods, with the exception of the tunnel system, which will be executed through a two-step fixed-price design-build model. It is important to note that the Building J work is on the overall program critical path and must be completed to allow the construction of the Tunnel System.

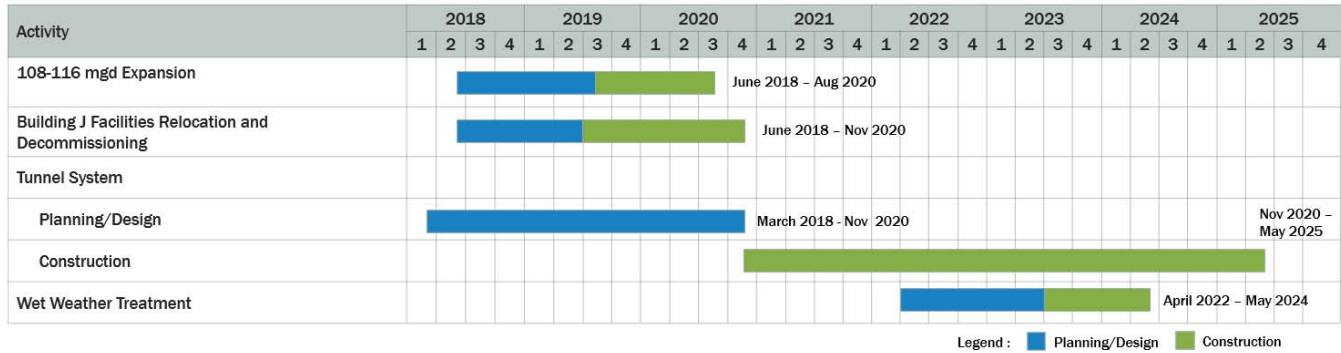


Figure ES-3. Projects Scheduled in Coordination with RiverRenew

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