Ad Hoc Combined Sewer System Plan Stakeholder Group
(CSS Stakeholder Group)

City Council Workroom, 301 King Street City Hall
Alexandria, VA 22314

Thursday, April 7, 2016
7:00 PM – 9:00 PM

Agenda

1) Welcome and Call to Order
   a) Acceptance of Meeting #5 Summary 7:00 – 7:05

2) Schedule and Implementation
   a) Technical Presentation 7:05 – 8:00
   b) Stakeholder Group Discussion 8:00 – 8:25
   c) Public Comment 8:25 – 8:30

3) Wrap up and Adjournment 8:30

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Alexandria, VA 22314

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Discussion Questions

Do you agree with the proposed Long Term Control Plan Update framework and the recommendation that City Council approve the framework as presented? Do you have any comments on the Stakeholder Group memorandum to Council?

City of Alexandria, Virginia

Long Term Control Plan Update

CSS Stakeholder Group
Meeting #6
April 7, 2016

Department of Transportation and Environmental Services

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ECO-CITY ALEXANDRIA

City of Alexandria, Virginia

PRESENTATION OUTLINE

- ❑ Long Term Control Plan Framework
- ❑ Schedule and Implementation Plan
- ❑ Cost and Cost Impact
- ❑ Discussion
  - ❑ Stakeholder Group Recommendations
  - ❑ Memo to Council

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Long Term Control Plan Update Framework

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Store and Treat
Primary Strategy

* 10-foot diameter tunnel (1.6 million gallons) for Hooffs Run (Outfall 003/004) and 3-million gallon tank for Royal Street (Outfall 002)
  - More than the minimum
  - Helps to mitigate regulatory uncertainty
  - Helps to mitigate climate change
  - Less than 4 overflows per year during the typical year

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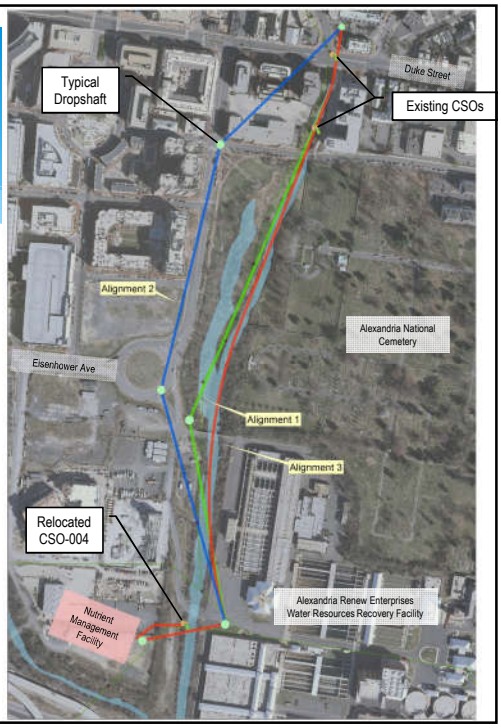
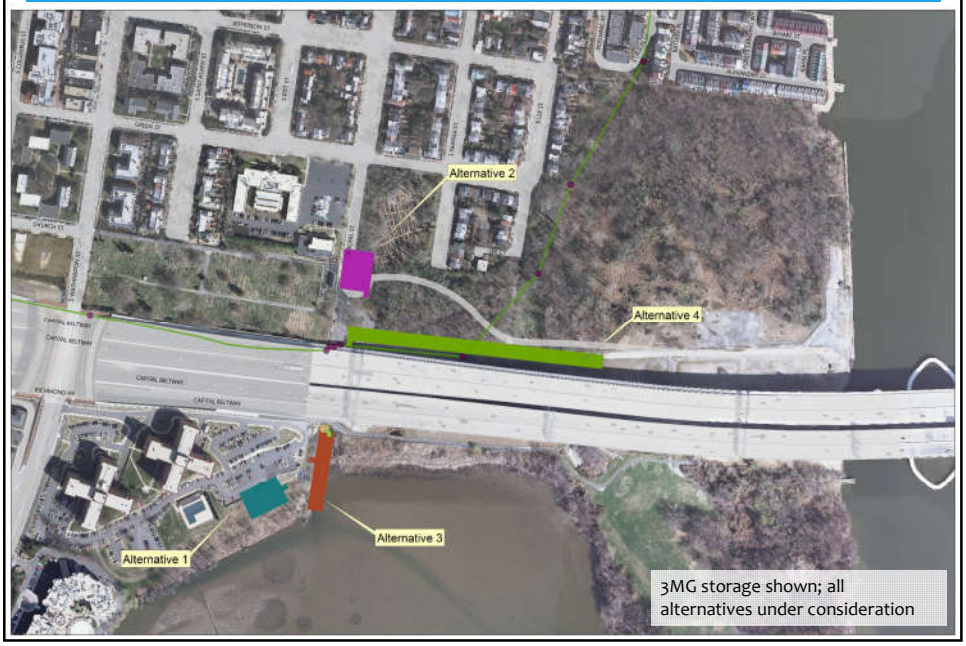
CSO-003/004 Tunnel Alignments

- Shafts range in diameter from 20-ft to 30-ft
- Shafts and tunnel range in depth from 60-ft to 100-ft
- Alignment 2 eliminated from further consideration
- Alignment 3 preferred alignment



CSO-002 Storage Tank Alternatives



Green Infrastructure
Complementary Strategy Recommendation

- Implement the program citywide, not just combined sewer area
- **$1-2 million** for implementation of project in next permit cycle (2018-2023) in Capital Improvement Program
- Evaluate increasing number of street trees (tree canopy) in combined sewer system
- Assess effectiveness and based on assessment, consider establishing program and target goals for future permit cycles

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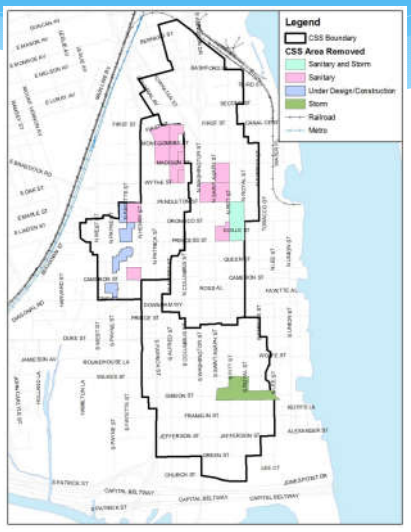
Other Complementary Strategies

- Targeted Sewer Separation
  - Condition of redevelopment
  - Example: ABC/Giant project
    - Onsite sanitary separation
    - Offsite sanitary separation of 173-room hotel
- Other Potential Opportunities
  - Private property incentives



Proposed Framework for CSO-001

* CSO-001 Phase I
  - Enhanced Sewer Separation and Green Infrastructure Opportunities
    - Coordinate with North Old Town Small Area Plan implementation
* CSO-001 Phase II
  - Assess following CSO-001 Phase I and CSO-002/003/004 Projects
  - Implement a plan consistent with the current regulatory requirements

LTCPU Framework

* Reduce number of overflows from 60-70 per year to 4-6 per year
  - Overflow volume reduction of over 90%
* Substantial CSO bacteria reduction and associated water quality improvements
* Phased approach – facilitates sequential implementation while managing rate increases
* Consistent with Eco-City goals

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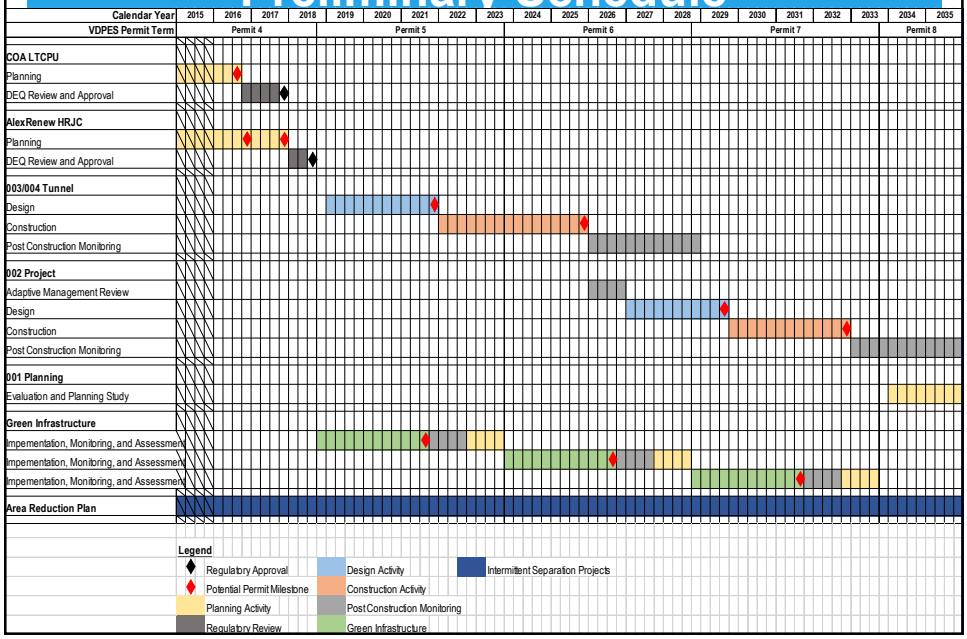
Schedule and Implementation Plan

Phased Construction

* Projects constructed in phases rather than all at once
  - CSO-003/004 tunnel constructed first
  - CSO-002 tank constructed second
  - Green Infrastructure and Sewer Separation
    - Continuous implementation as a combination of redevelopment and City-led projects
  - CSO-001
    - CSO-001 Phase I in coordination with North Old Town Small Area Plan including enhanced green infrastructure and sewer separation in the Pendleton shed
    - CSO-001 Phase II following a reassessment following Phase I and completion of CSO-002/003/004 projects

Preliminary Schedule



CSO-003/004 Tunnel (Primary Strategy)

- 2019 – 2021: Design
- 2022 – 2025: Construction
- 2026 – 2028: Post Construction Monitoring

- Capital Budget: $80 - $120 million
  - Includes associated wet weather improvements at AlexRenew

CSO-002 Storage Tank (Primary Strategy)

- 2026: Adaptive Management Review
- 2027 – 2029: Design
- 2030 – 2032: Construction
- 2033 – 2035: Post Construction Monitoring

- Capital Budget: $35 - $53 million

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Green Infrastructure (Complementary Strategy)

- 2016 – 2017: Existing Permit
  - Continue to implement existing green infrastructure pilot projects
- 2018 – 2023: Next Permit
  - Add funding in 10-year Capital Improvement Program and implement variety of green infrastructure practices
  - Evaluate/implement incentive programs for private property
  - Evaluate/implement increasing number of street trees (tree canopy) in CSS
  - Assess effectiveness of different practices compared to cost of implementation and neighborhood impacts
- 2024-2035: Future Permit Cycles
  - Based on assessment, consider establishing program and target goals for future permit cycles

- Capital Budget: $5 - $7.5 million

Rain Gardens

Planter Boxes

Targeted Sewer Separation (Complementary Strategy)

* 2016 – 2035: Continue the Area Reduction Plan (ARP)
  - Implemented as part of redevelopment (developer paid)
  - Some City led projects (e.g. Payne and Fayette) where cost effective and feasible
  - Applicable to all basins, including Pendleton (CSO-001)
* Capital Budget: $5 - $7.5 million

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CSO-001 Strategy

* 2018-2033: CSO-001 Phase 1
  - Synergies with the goals of North Old Town Small Area Plan
  - Targeted Sewer Separation
  - Green Infrastructure
* 2034-2035: CSO-001 Phase 2
  - Reassess based on:
    - Progress of CSO-001 Phase 1
    - Performance of other projects (CSO-002/003/004)
    - Future regulatory environment

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Cost and Cost Impact

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LTCPU Cost Summary

Long Term Control Plan Update Program Component	Capital Cost (in millions)
CSO-003/004 Storage Tunnel and Facilities	$80 - $120
CSO-002 Storage Tank and Facilities	$35 - $53
Green Infrastructure	$5 - $7.5
Targeted Sewer Separation	$5 - $7.5
Total	**$125 - $188**

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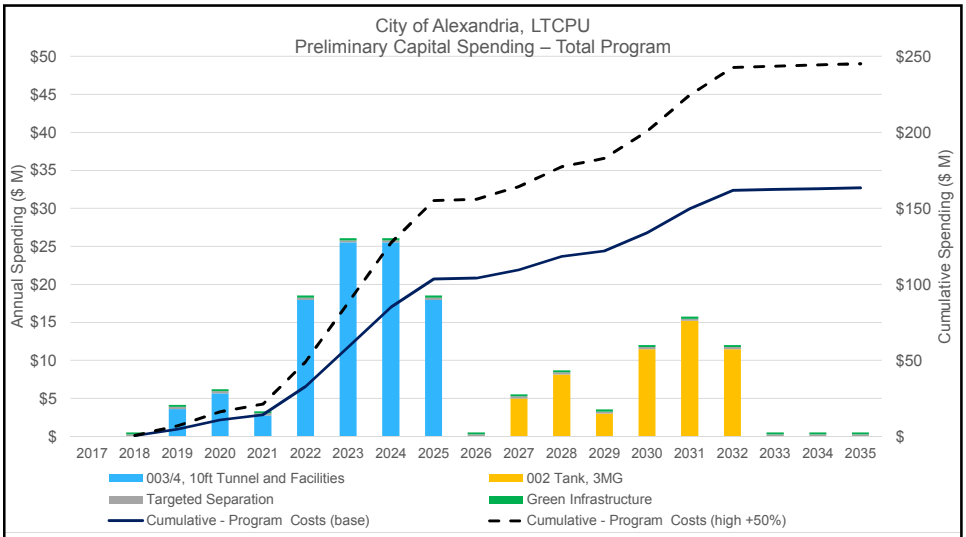

003/4 Tunnel / 002 Tank[1]	$/household[2]	$/household/yr[2]
10' tunnel / 3 MG tank	$1,800 ±	$100 ±

Notes:
1. Includes capital costs for a tunnel for CSO 003/4, a tank for CSO 002, and allowances for GI and targeted separation in 2015 dollars.
2. Costs are preliminary (-30%/+50%) and developed to provide context. Additional analysis of the financing and impact on the sewer rate is on-going.

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Monthly Sewer Bill

Items	Value
AlexRenew Monthly Base Charge - Residential	$8.38
AlexRenew Monthly Base Charge – Commercial	Varies based on connection size
AlexRenew Flow Charge	$6.44/1,000 gallons
City of Alexandria Flow Charge	$1.25/1,000 gallons

	Additional Monthly Cost[1]	Total Monthly Bill[2]
Existing Sewer Bill	---	~$47
Long Term Control Plan Update Implementation	$10-15	~$57 - $62

Notes:
1. Annual rate increases to be implemented over time and provided in the Sanitary Sewer Master Plan Update (2017-2018)
2. Based on average usage of 5,000 gallons per month

Sewer Master Plan Update

Staff will update Sewer Master Plan, including detailed rate study (next 18-24 months):

- Update projects in our existing CIP that can be leveraged towards LTCPU
- Reflect LTCPU in the master plan
- Reflect infrastructure resulting from approved Small Area Plans
- Evaluate city charge including connection fee
- City working closely with Alexandria Renew to evaluate scenarios that will result in least impact on the total sanitary charge

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Discussion:
Stakeholder Group Recommendations and Memo to Council

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Stakeholder Group Discussion

* Do you agree with the proposed Long Term Control Plan Update framework and the recommendation that City Council approve the framework as presented? Do you have any comments on the Stakeholder Group memorandum to Council?

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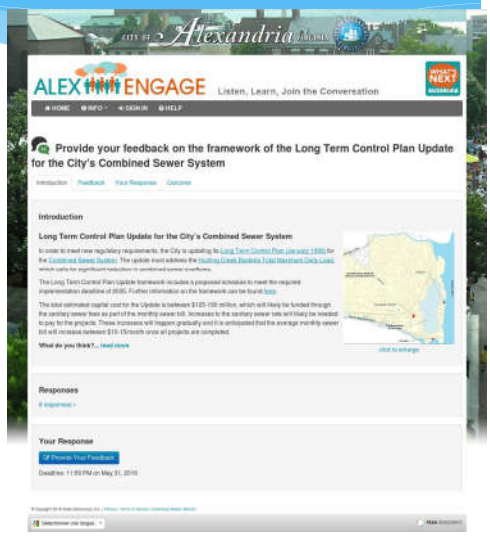
Feedback on LTCPU

* Public Meeting – Thursday April 21, 2016 7:00PM, City Hall, 301 King Street, Conference Room 1101
* Planned City Council Public Hearing – Saturday May 14, 2016 9:30AM
* AlexEngage Webpage – Link to survey at: www.alexandriava.gov/sewers



City of Alexandria, Virginia

Thank You

DATE: APRIL 7, 2016

TO: THE HONORABLE MAYOR AND MEMBERS OF CITY COUNCIL
MARK B. JINKS, CITY MANAGER

FROM: SKIP MAGINNISS, CHAIR AD HOC COMBINED SEWER SYSTEM PLAN STAKEHOLDER GROUP (STAKEHOLDER GROUP)

C: MEMBERS OF THE AD HOC COMBINED SEWER SYSTEM PLAN STAKEHOLDER GROUP
WILLIAM SKRABAK, DEPUTY DIRECTOR, T&ES

SUBJECT: DRAFT – Report and feedback on draft framework of the Combined Sewer System Long Term Control Plan Update (LTCPU)

The Virginia Department of Environmental Quality (VDEQ) completed the Hunting Creek Total Maximum Daily Load Study for Bacteria in 2010 which resulted in load/discharge allocations for overflows from the City's Combined Sewer System (CSS). The CSS permit issued to the City by VDEQ in 2013 required City to update its Long Term Control Plan (LTCP) to address Hunting Creek TMDLs. Planning for mitigation of Combined Sewer Overflows is important not only to keep the City in compliance with its environmental permit obligations, but also for maintaining the City's environmental stewardship, and is consistent with the City's Eco-City Alexandria Environmental Action Plan.

T&ES staff, along with its consultants presented complex technical information in an easy to understand form which facilitated an excellent discussion not only among the members of the Stakeholder Group, but also from members of the public who were invited to comment after each agenda item was presented.

OVERALL FRAMEWORK OF DRAFT LTCPU

The framework of the Long Term Control Plan Update (LTCPU) primarily comprises of implementation of store and treat technology complimented with green infrastructure and targeted separation in three of the four outfalls in the system that discharge into Hunting Creek or its tributary Hooffs Run. Specifically the proposed framework includes:

1. Construction of a 1.6 million gallon storage tunnel to store and treat combined sewage from the Hooffs Run (CSO-003 and CSO-004) combined sewershed. This tunnel would be 10-foot in diameter and approximately 2700-feet in length.
2. Construction of a 3.0 million gallon storage tank to store and treat combined sewage from the Hunting Creek (CSO-002) combined sewershed.
3. Enhanced implementation of green infrastructure as a complementary strategy.
4. Continued implementation of the Area Reduction Plan, which calls for sewer separation as a condition of redevelopment.
5. A two-phased approach for CSO-001 where Phase I includes implementation of green infrastructure and sewer separation while the CSO-002/003/004 projects are being

implemented. Following the completion of these projects, the City would begin Phase II which includes an assessment of the effectiveness of Phase I and the planning of infrastructure at CSO-001 to address future regulatory requirements.

The proposed combined sewer facilities will reduce the number of overflows from 50-70 per year to 4-6 per year on average. The planning level capital cost for the LTCPU is equal to $125-$188 million (2016 dollars). It is anticipated that the construction of the CSO-003/004 tunnel will be implemented first with construction being completed on or around 2025. Design and construction will then proceed for the CSO-002 storage tank, with construction being completed by 2032.

STAKEHOLDER GROUP RECOMMENDATIONS

Based on the information presented by Staff and subsequent Stakeholder Group discussions and input received from the public at the meetings, the Stakeholder Group recommends that City Council approves the framework of the Long Term Control Plan Update.

The Stakeholder Group believes that the framework plan developed by Staff, with input from Stakeholder Group and public, is reasonable and achieves appropriate balance between regulatory drivers, cost implications, and improvements to water quality and environment. The plan also addresses CSO-001 (Oronoco Bay) and allows for sequential implementation of the projects. While construction impacts were taken into account in development of the plan and project recommendations, the Stakeholder Group recommends continued engagement with public as specific projects are developed further and implemented. The group recognizes that the funding required to implement the LTCPU is substantial, and therefore it is important that Council identify ways to keep the impacts on the sanitary sewer rates minimum, including but not limited to seeking funding from state or federal grants.

BACKGROUND AND PROCESS

On June 23, 2015 the Alexandria City Council adopted Resolution No. 2683 to form the Ad Hoc Combined Sewer System Plan Stakeholder Group (Stakeholder Group) to provide Staff with input the Long Term Control Plan Update (LTCPU) for addressing combined sewer overflows.

The Stakeholder Group had four objectives:

1. *"Provide staff of Transportation and Environmental Services (T&ES), Management & Budget (IMB), Office of Historic Alexandria (OHA), Recreation, Parks and Cultural Activities (RPCA) and Alex Renew with recommendations on how a primary combined sewer system control strategy can accomplish the City's environmental goals and permit requirements while minimizing impacts to the community;*
2. *Review and monitor the preparation of the Long Term Control Plan Update, including ongoing permit and other regulatory issues, engineering and analysis of potential locations of future combined sewer infrastructure facilities, and consideration of an implementation plan schedule and funding strategy;*
3. *Serve as a central information-receiving/dissemination body related to the City's Long Term Control Plan Update;*

4. *Receive input from the public during development of the Long Term Control Plan Update."*

The 13-member group, appointed by the City Manager, was comprised of constituents that represented various interests throughout the City. Members of the Stakeholder Group and their representation are provided in Attachment 1.

A series of monthly meetings were held at which Staff and their consultants presented information on the LTCPU and progress on its development. Attachment 2 provides a listing of the Stakeholder Group meetings including dates and topics covered.

At each of these meetings, staff presented a series of discussion topics in order to generate discussion among the Stakeholder Group and to gather feedback on key decisions for the LTCPU. Substantial technical information was presented and questions from the members of the Stakeholder Group were addressed. Formal meeting notes were prepared following each meeting and presented to the Stakeholder Group for their review and approval. Comments from the public were also received and recorded at each of the meetings. This memorandum summarizes the discussion between Staff and the Stakeholder Group and feedback provided by the Stakeholder Group and public at the meetings. This memorandum is intended to present the general recommendations from the Stakeholder Group and is not intended as a transcript of all feedback gathered at the meetings.

STRATEGY DISCUSSION

Staff and their engineering consultant have developed an overall framework for the LTCPU which recommends that store and treat infrastructure will be the primary strategy to address the Hunting Creek Bacteria Total Maximum Daily Load (TMDL) for CSO-002, CSO-003, and CSO-004. Three store and treat infrastructure options were presented to the Stakeholder Group to consider. These infrastructure options included a combination of underground tunnels and tanks to accomplish the store and treat strategy. For CSO-002 (Royal Street), the City's engineering consultant recommended a storage tank at the south end of Royal Street over a storage tunnel. The storage tank is less expensive and limits the areas of disruption within Old Town. For CSO-003/004, the City's engineering consultant recommended a storage tunnel from Duke Street, running south along Hooffs Run, and terminating at the AlexRenew site for CSO-003/004. The Stakeholder Group generally supported the engineering consultant's recommendations. Members of the Stakeholder Group noted care and diligence should be exercised during any excavations due to the potential for archeological artifacts. Staff has engaged the City archeologist and has plans for an archeologist to be onsite during excavation activities.

In addition to the store and treat primary strategy, complementary strategies such as green infrastructure, sewer separation, and other potential opportunities will be implemented. The LTCPU can be thought of as a pyramid with store and treat forming the base and the complementary strategies helping to control combined sewer overflows even further.

TUNNEL ALIGNMENTS AND TANK SITES

Staff presented alignments for the CSO-003/004 storage tunnel to the Stakeholder Group. A storage tank was not considered for these outfalls due to available space limitations. Three preliminary alignments were presented and two alignments one of which being preferred, were recommended for inclusion in the LTCPU. **The Stakeholder Group agreed with Staff's recommended alignment.**

Staff asked the Stakeholder Group if a storage tunnel or storage tank should be implemented for CSO-002. **The general consensus was that a storage tank should be implemented for CSO-002.** This was mainly due to the lower cost of a storage tank compared to a tunnel and that construction of a storage tank would have less disruption in Old Town than a tunnel. Four potential storage tank site alternatives were presented to the Stakeholder Group and discussed. Although each site poses its own challenges, the Stakeholder Group agreed with Staff's recommendation to evaluate all sites further once the LTCPU has been submitted.

INFRASTRUCTURE SIZING DISCUSSION

The Stakeholder Group was presented with a series of infrastructure sizing options for the store and treat infrastructure that satisfied the regulatory requirements. Infrastructure sizing options, along with their associated costs, were compared to potential additional benefits. Specifically, the cost was compared to the reduction in overflows per year, total overflow volume and the potential water quality benefits. A significant majority of the Stakeholder Group recommended **a 10-ft diameter storage tunnel (1.6 million gallons) for CSO-003/004 and a 3.0 million gallon storage tank for CSO-002 for inclusion in the LTCPU**. The primary reasons for this recommendation was that larger sizing would help accommodate climate change and future regulatory uncertainty. Two members of the Stakeholder Group preferred the minimum infrastructure sizing to meet the regulatory requirements (8-foot tunnel (1.0 million gallons) for CSO-003/004 and 2.0 million gallon tank for CSO-002) and one member was open to larger infrastructure (12-foot tunnel (2.3 million gallons) for CSO-003/004 and 4.0 million gallon tank for CSO-002).

GREEN INFRASTRUCTURE

A significant portion of the meetings focused on the implementation of green infrastructure within the LTCPU. Advantages discussed by the Stakeholder Group included reducing impervious areas, reducing runoff, water quality improvements, and other ancillary benefits. Several members of the Stakeholder Group identified potential synergies with the City's recent tree canopy and green alleys initiatives. Disadvantages of green infrastructure included potential impacts to the historic fabric of Old Town; constructability and effectiveness in Old Town, including disruption and parking impacts; and limited benefits in terms of the combined sewer overflows (e.g., volume and bacteria reductions). The Stakeholder Group generally recommended that green infrastructure should not be confined to the combined sewer system area and instead **a commitment in the LTCPU should be made to implement green infrastructure throughout the City**. Several members of the Stakeholder Group stressed that green infrastructure should only be considered where it is cost effective. City staff ultimately

recommended that $1-2 million would be spent on green infrastructure during the next permit cycle (2018-2023) and then an adaptive management approach would be adopted in subsequent 5-year permit cycles based on the effectiveness. The Stakeholder Group generally agreed with staff's recommendation.

CSO-001 FRAMEWORK

The Hunting Creek Bacteria does not apply to CSO-001 and therefore there is no regulatory requirement to reduce overflows at this time. However, as part of the LTCPU process, staff developed a preliminary strategy for CSO-001 to address the overflows. Staff presented this strategy as a two-phased approach:

- *CSO-001 Phase I – Continue sewer separation and implement Green Infrastructure in the Pendleton sewershed to reduce overflows at CSO-001 over time.*
- *CSO-001 Phase II – Reassess the level of control following substantial completion of other CSO projects (CSO-002/003/004), performance of CSO-001 Phase I, and future regulatory requirements.*

This two-phased approach for CSO-001provides several advantages. First, it provides an opportunity to leverage redevelopment associated with the North Old Town Small Area Plan (SAP) with continued sewer separation and implementation of green infrastructure to reduce overflows consistent with the Eco-District goals. Second, if a regulatory requirement is eventually imposed, the City will have the opportunity to assess the level of control based on the performance of CSO-001 Phase I and known regulatory requirements.

The Stakeholder Group agreed that this was a reasonable approach and made the most sense for the area. Concerns were raised by two members of the Stakeholder Group that CSO-001 is not being addressed concurrently with other two projects because it is the largest of the three combined sewersheds. In general the Stakeholder Group recognized that the overall approach is reasonable to address outfalls to meet regulatory requirements first, but wanted to be sure City does not neglect as part of the long-term planning. In addition they recommended that the City work with the Robinson Terminal North redevelopment to make sure that the redevelopment does not preclude future infrastructure needed to address CSO-001.

IMPLEMENTATION PLAN

It is anticipated that the infrastructure projects would be constructed in phases rather than all at once. Based on the needs of the City and synergies with other sewer projects in the City, and for Alexandria Renew Enterprises, the CSO-003/004 storage tunnel will likely be designed and constructed first (between 2019-2025) and the CSO-002 storage tank will be designed and constructed following completion and a performance evaluation of the CSO-003/004 storage tunnel (between 2026-2032). Both projects must be constructed by 2035. The Stakeholder Group generally agreed with the phased implementation of the two major infrastructure projects. Additionally, City staff is including in the LTCPU a commitment to assess CSO-001, around 2033-2034, based on the progress of separation and green infrastructure in the Pendleton shed as part of CSO-001 Phase I, and performance of the other CSO projects (CSO-002/003/004).

Staff presented the program costs to the Stakeholder Group, which are equal to $125 million to $188 million (2016 dollars). The LTCPU projects will be funded through the sanitary sewer rates. Currently, the average household in Alexandria pays $45-50 per month on their sewer bill. Studies are underway to determine the impact of these projects on the sewer rates, but preliminary estimates indicate that the expected impact will be an increase of $10-15 per month on the monthly sewer bill for these projects. These increases to the billing is expected to be implemented over time.

The Stakeholder Group generally concluded that the overall schedule and costs presented for the LTCPU is a reasonable balance of cost and complying with the new regulations in the allowed timeframe.

LIST OF ATTACHMENTS

Attachment 1 – Members of the Combined Sewer System Stakeholder Group
Attachment 2 – List of Stakeholder Group Meetings

Attachment 1
Members of the Combined Sewer System Stakeholder Group

Name	Organization
Rich Brune – *Vice-chair*	Parks and Recreation Commission
Lee Hernly	Carlyle Community Council
Stacy Langsdale	At-large member – Carlyle area
Skip Maginniss – *Chair*	Budget and Fiscal Affairs Committee
Elizabeth McCall	Alexandria Archaeological Commission
Kate MacKenzie	At-large member – Porto Vecchio
Stephen Milone	Environmental Policy Commission
Randy Randol	Old Town Civic Association
Brett Rice	Chamber of Commerce
Dixie Sommers	At-large member – Friends of Dyke Marsh
Jack Sullivan	At-large member – Citywide
Thomas Walker	At-large member – Citywide
Chuck Weber	Old Town Civic Association

Attachment 2
List of Stakeholder Group Meetings

Meeting	Date	Topics

Meeting #1	October 7, 2015	• Purpose and Goals
		• City's Combined Sewer System
		• Investing in Infrastructure
		  ○ Combined Sewer Overflow Strategies
		  ○ Evaluation Process
		  ○ Combined Sewer Overflow Strategies – Ranking and Shortlist

Meeting #2	November 2, 2015	• Combined Sewer Overflow Control Strategies: Ranking and Shortlist • • Green Infrastructure Overview and Strategy
Meeting #3	January 7, 2016	• Infrastructure Sizing Analysis • Green Infrastructure Strategy
Meeting #4	February 4, 2016	• Infrastructure Sizing Recommendation • Tunnel Alignments and Tank Sites • Green Infrastructure Strategy Recommendation
Meeting #5	March 3, 2016	• CSO-001 Background • CSO-001 Strategy
Meeting #6	April 7, 2016	• LTCPU Framework • Schedule • Rate Impact • Stakeholder Group Memorandum