



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

1101 Sister Cities, 301 King Street City Hall
Alexandria, VA 22314

Wednesday, October 7, 2015

7:00 PM – 9:00 PM

Agenda

- 1) Welcome and Introductions
 - a) Staff and Project Team
 - b) CSS Stakeholder Group (CSSSG) Members
 - i) Self-introduction & area represented
- 2) Charge of the CSS Stakeholder Group
 - a) Background
 - b) Roles and Responsibilities
 - c) Ground Rules
 - d) Notebooks
- 3) Technical Presentation
 - a) Purpose and Goals
 - b) City's Combined Sewer System (CSS)
 - c) Investing in Infrastructure
 - i) Combined Sewer Overflow Strategies
 - (1) Description
 - (2) Evaluation Process
 - (3) Ranking and Shortlist
- 4) Discussion
- 5) Public Comment
- 6) CSS Stakeholder Group Schedule (next 8 months)
 - a) Meeting Calendar
 - b) Potential Field Visit
- 7) Wrap up and Adjournment – Next Meeting Monday November 2, 2015 7pm-9pm Sister Cities Conference Room 1101

Ad Hoc Combined Sewer System Plan Stakeholder Group

CSS Stakeholder Group Members

Name	Organization
Rich Brune – <i>Co-chair</i>	Parks and Recreation Commission
Lee Hernly	Carlyle Community Council
Stacy Langsdale	At-large member – Carlyle area
Skip Maginniss - <i>Chair</i>	Budget and Fiscal Affairs Committee
Elizabeth McCall	Alexandria Archaeological Commission
Kate McKenzie	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

City of Alexandria Transportation and Environmental Services Staff

Name	Organization	Email
William Skrabak	Deputy Director, Infrastructure and Environmental Quality	William.Skrabak@alexandriava.gov
Lalit Sharma, P.E.	Division Chief, Stormwater and Sanitary Infrastructure Division	Lalit.Sharma@alexandriava.gov
Erin Bevis-Carver, P.E.	Sanitary Section Lead, Stormwater and Sanitary Infrastructure Division	Erin.BevisCarver@alexandriava.gov

Consultants

Name	Organization	Email
John McGettigan, P.E.	Greeley and Hansen LLC – Engineering	jmcgettigan@greeley-hansen.com
Dustin Dvorak, P.E.	Greeley and Hansen LLC – Engineering	ddvorak@greeley-hansen.com
John Cassidy, P.E.	Greeley and Hansen LLC - Principal	jcassidy@greeley-hansen.com
Clyde Wilber, P.E.	Clyde Wilber LLC – Regulatory	cw@clydewilberllc.com
Beth Offenbacker	Waterford, Inc. – Public Engagement	beth@waterfordinc.com
Paul Coelus	Waterford, Inc. – Public Engagement	paul@waterfordinc.com

CSS Stakeholder Group

Roles and Responsibilities

Background

On May 26, 2015, City Council conducted a work session with staff to establish a short list of three Combined Sewer System control technologies and strategies for further evaluation and refinement of feasibility and cost. Ultimately, the City must propose one primary combined sewer system control strategy to the Virginia Department of Environmental Quality by August 2016 in order to meet its permit requirements. At the work session, Council requested creation of a stakeholder group to provide input to staff as it further refines the three short-listed strategies, including implications for the City's budget and how the primary strategy will accomplish the City's environmental goals and permit requirements while minimizing impacts to the community. Staff is also continuing additional community outreach efforts on a parallel track in order to present initial community input to the Stakeholder Group once it convenes.

Role	Responsibilities
1. Provide 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.	Attend and actively participate in all CSS Stakeholder Group (CSG) meetings. Notify the CSG staff contact, Erin Bevis-Carver, in advance if you will be unable to attend a meeting. Send written questions, concerns or comments related to the subject matter for the meeting you will miss.
2. Review and monitor the preparation of the Long Term Control Plan Update (LTCPU), 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.	Review all meeting agendas and associated materials in advance of CSG meetings. Bring questions, concerns or comments with you to the CSG meeting.
3. Serve as a central information-receiving / dissemination body related to the City's Long Term Control Plan Update.	Actively pursue opportunities to provide information about the CSG's purpose and activities to those organizations you represent.
4. Receive input from the public during development of the Long Term Control Plan Update.	Actively pursue stakeholder input about the CSG's purpose and activities. Provide input about stakeholder needs and interests at SWG meetings or to City staff as appropriate. Assist City staff with efforts to convene community or stakeholder meetings about the CSG's purpose and activities.

CSS Stakeholder Group

City Council will approve the Long Term Control Plan Update based on many inputs including:

- City Staff and their consultants
- CSS Stakeholder Group
- Technical Review Panel
- General public input
- Other inputs

Ground Rules for Discussion

1. Every person in the group gets *a chance* to speak once before anyone speaks twice.
2. Be *explicit* when you speak whether you are speaking for yourself, or sharing input provided by those you represent.
3. Be aware of *assumptions*, especially your own. *Talk about them.*
4. Suspend *judgment*, even when you disagree.
5. Address *one another*, not the facilitator.
6. Avoid *repeating* what was just said; instead build on previous comments or identify new thoughts to contribute.

Finally, help the facilitator enforce these ground rules.

City of Alexandria, Virginia

Combined Sewer System Permit and Long-Term Control Plan Update

CSS Stakeholder Group Meeting #1 October 7, 2015

Bill Skrabak, Deputy Director, Infrastructure and
Environmental Quality

Department of Transportation and Environmental
Services



City of Alexandria, Virginia

PRESENTATION OUTLINE

- Purpose and Goals
- City's Combined Sewer System (CSS)
- Investing In Infrastructure
 - Combined Sewer Overflow Strategies
 - Evaluation Process
 - Combined Sewer Overflow Strategies – Ranking and Shortlist



City of Alexandria, Virginia

Purpose and Goals



Public Participation Goals

- * **Inform.** Increase stakeholder awareness of the City's combined sewer system and the Long Term Control Plan Update program.
- * **Educate.** Develop basic understanding of the Long Term Control Plan Update recommended strategies.
- * **Be Responsive.** Awareness, consideration and responsiveness on the Long Term Control Plan.
- * **Seek Input.** Solicit feedback on the combined sewer control strategy recommendations.

Why We Need Your Participation

- * Alexandria's commitment to environmental stewardship
- * Alexandria's commitment to the public participation process and civic engagement (*What's Next Alexandria*)
- * Community input and support is essential to the success of the program
- * Public input helps the City make the best decision
- * Future construction will impact the community

How the Long Term Control Plan Update Might Affect You

- * Cost
 - The Long Term Control Plan projects will be part of the City's budgeting process
 - Potential sewer rate impacts
- * Construction Impacts
 - Noise, road closures, etc
- * Improved Environment
 - Improved water quality in Hunting Creek
 - Potential for ancillary benefits

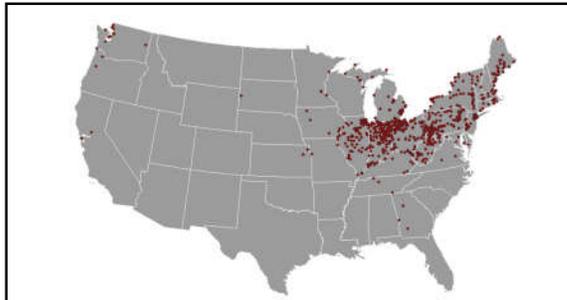
City of Alexandria, Virginia

City's Combined Sewer System (CSS)

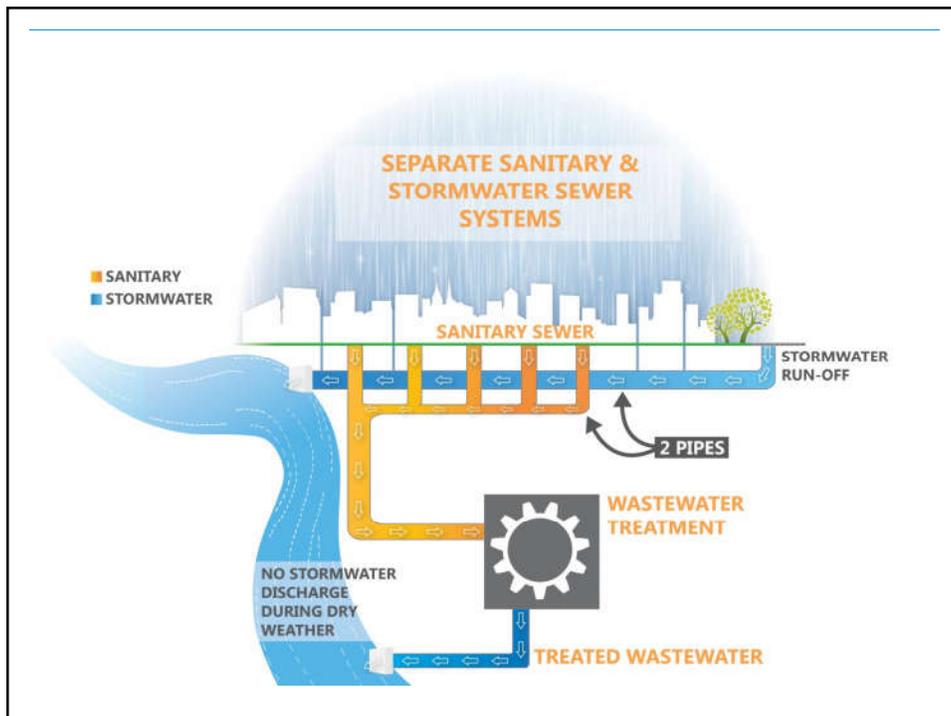
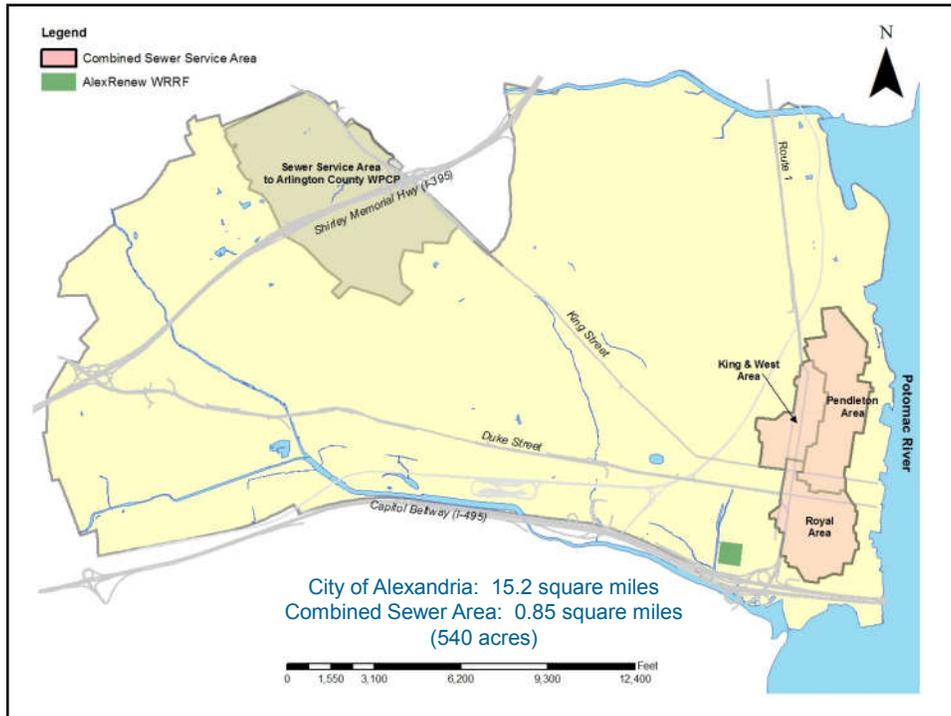


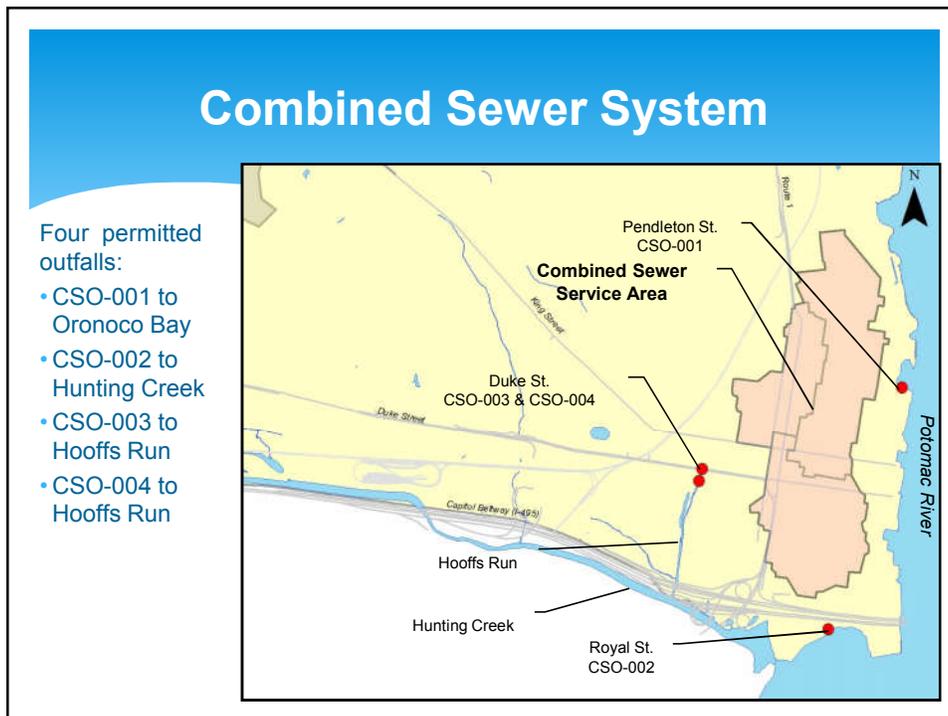
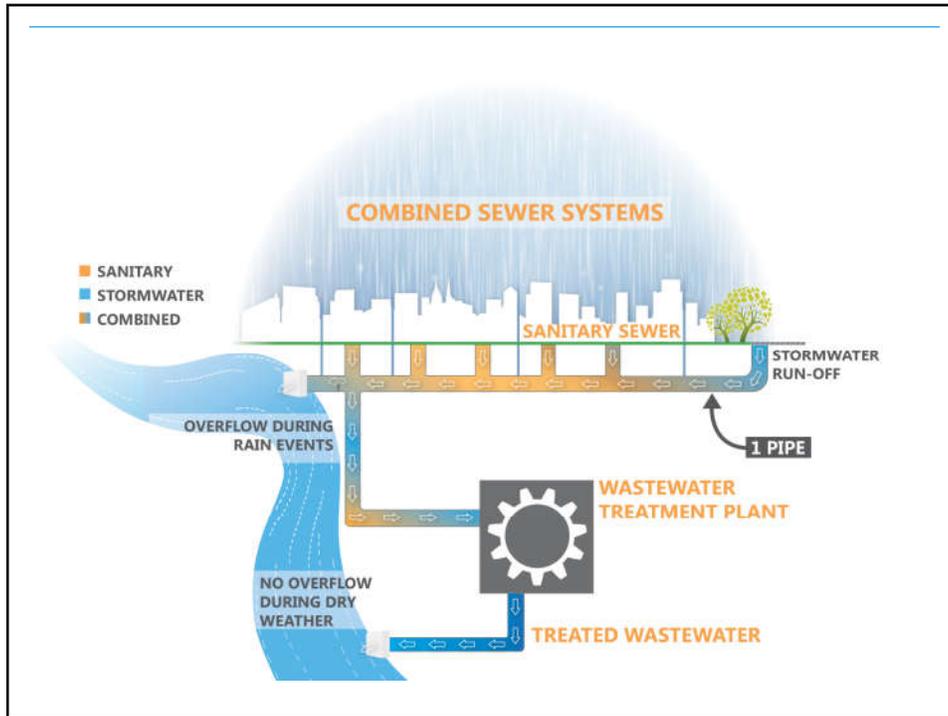
Location of Combined Sewer System (CSS) Communities

- * Combined sewer communities are concentrated in older communities in the North East and the Great Lakes regions.
- * Currently, 772 authorized discharges from 9,348 combined sewer outfalls in 32 states and DC
- * Nearby combined sewer communities include Washington, DC, Richmond, and Lynchburg.



Photo/Graphics Source: www.theodorelim.gov





Combined Sewer Overflow (CSO) Locations



Oronoco Bay: CSO-001



Hunting Creek: CSO-002



Hooffs Run: CSO-003 & 004

CSO Frequently Asked Questions

What factors influence the frequency, duration, and volume of overflows?

- number of rain events
- frequency of the events
- intensity of the events
- characteristics of the sewershed
- characteristics of the specific outfall

How frequently do the overflows take place?

Typically 30 to 60 times/year

How long the overflow events last?

Typically 2 to 5 hours typically

What is the total number of hours this occur over a year?

Equivalent of 3 to 12 days, depending on the outfall

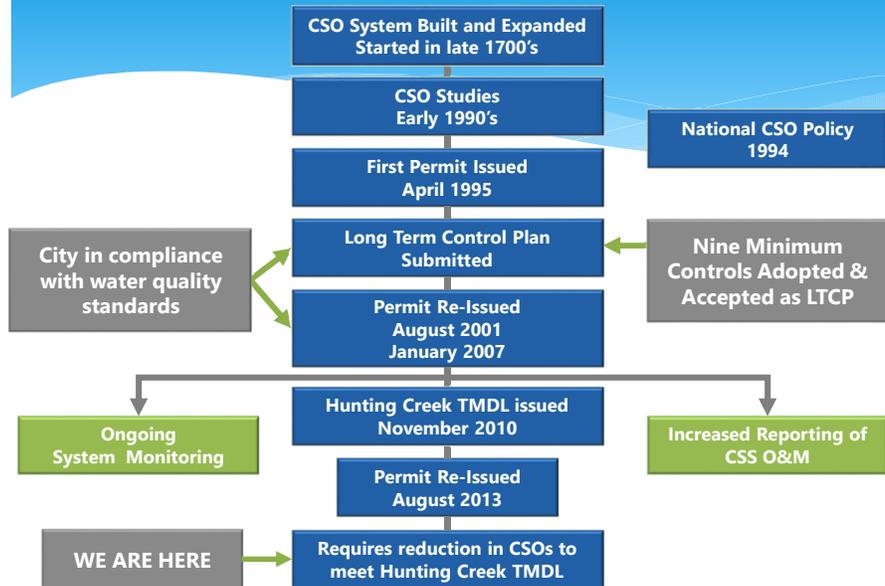
How much of the overflows is stormwater, and how much is wastewater?

Greater than 90% of the overflows is stormwater

Compliance with Federal/State Laws and Regulations



Regulatory History of Alexandria's CSS



Alexandria's Current Long Term Control Plan



Conduct Proper O&M Programs



Maximize flow to the POTW



Maximize use of the collection system for storage



Control solid and floatable material



Develop & Implement a pollution prevention program



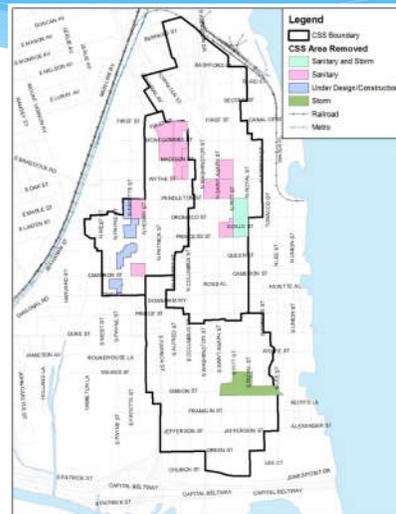
Prohibit CSOs during Dry Weather



Public Notification

City's Existing Area Reduction Plan

- * Formalized program and policies requiring sewer separation as condition of redevelopment
 - If separation infeasible, then contribute funds to City-led projects
- * Recently completed sewer separation projects
 - James Bland
 - Harris Teeter
- * City-led separation projects
 - Payne and Fayette Sewer Separation Project
 - Under construction
 - ~90 sanitary laterals to be separated



Paradigm Shift

- * Previous Combined Sewer System Permits (before 2013):
 - City's Long Term Control Plan based on best practices for operation and maintenance of combined systems
 - Proactive separation as part of Area Reduction Plan
 - Monitoring and modeling of combined sewer overflows
- * Current and Future Combined Sewer System Permits:
 - Must address the Hunting Creek Total Maximum Daily Load

Clean Water Act Goals Total Maximum Daily Load (TMDL)

- * Clean Water Act goal that all waters of the United States be “fishable” and “swimmable”
 - State develops impaired waters list and total maximum daily loads
- * Hunting Creek listed as an impaired water for *E. coli* bacteria



Sources of Bacteria in Hunting Creek TMDL

- * Virginia Bacteria Water Quality Criteria
 - 126 *E.coli* counts per 100mL
- * Sources of Bacteria:
 - Stormwater
 - Wildlife
 - Pets
 - Combined Sewer System
 - Sanitary Sewer Overflows
 - AlexRenew Water Resource Recovery Facility
 - Septic Systems

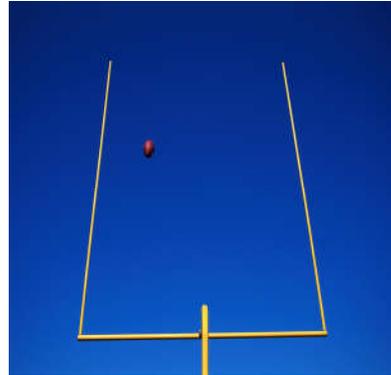


Hunting Creek Bacteria Total Maximum Daily Load

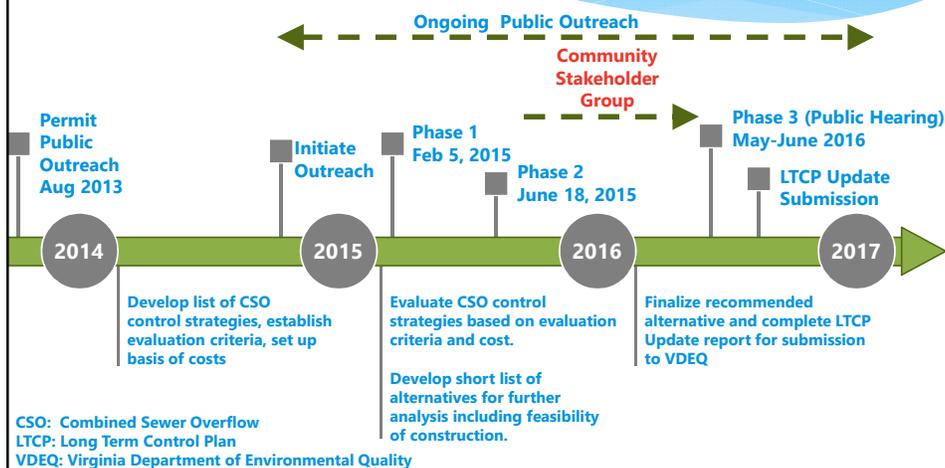
- * Hunting Creek Bacteria TMDL and CSOs:
 - Total overall bacteria reduction from CSO discharges of 86%:
 - 99% reduction from Outfalls 003 and 004 (Hooffs Run)
 - 80% reduction from Outfall 002 (Hunting Creek)
 - Applicable to Outfalls 002, 003, and 004 only
- * CSS Permit issued in August 2013 requires City to address TMDL through an update to its Long Term Control Plan

Long Term Control Plan Goals

- * Comply with the new permit
 - Reduce bacteria load
 - Improve water quality
- * Develop a plan that best meets the unique needs of Alexandria
- * Active participation by stakeholders
- * Limit impacts to residents and businesses
- * Preserve the historic character of the City
- * Improve and address legacy infrastructure
- * Remain fiscally responsible



Long Term Control Plan Update Schedule



City of Alexandria, Virginia

Investing in Infrastructure



CSO Control Impacts and Challenges

- * Construction in urban and historic area
- * Significant conflict with existing utilities
- * Quality of life: temporary disruption to residents and community
- * Economic: potential for temporary loss to business and tax revenue
- * Cost to implement CSO controls

Combined Sewer Strategies Evaluated

- * **Store and treat:** build CSO storage and send to wastewater treatment facility after CSO event for high level of treatment
 - Storage tanks (aboveground or underground)
 - Deep tunnels
- * **Sewer separation:** build new sewers to separate all storm and sanitary sewers in Old Town
- * **Green infrastructure:** Reduce stormwater runoff
- * **Disinfection:** kill the bacteria in the overflow
- * **Combination** of the above strategies

Storage Tunnels



DC Water: Tunnel Boring Machine



Storage Tunnels

Advantages:

- * Captures and stores the combined sewer overflow and then sends it to the wastewater treatment plant for a high level of treatment
- * Minimal aesthetic impact and spatial requirements, as the facilities are largely underground
- * Generates credits for stormwater

Disadvantages:

- * Complex construction project
- * Easement acquisition likely required
- * Construction impacts at tunnel access shafts

Storage Tanks



Toronto: Keelesdal-Hyde Ave
Underground CSO Storage Tank



Arlington: Water Pollution Control Plant

Storage Tanks

Advantages:

- * Captures and stores the combined sewer overflow and then sends it to the wastewater treatment plant for a high level of treatment
- * Anticipated to be one of the less costly infrastructure control strategies
- * Generates credits for stormwater

Disadvantages:

- * May be difficult to site due to lack of available space
- * Easement acquisition likely required

Sewer Separation



Alexandria: King & West
Diversion Structure

Sewer Separation

Advantages:

- * Over time will eliminate the combined sewer system (separate storm and sanitary sewers)
- * New sewer infrastructure constructed

Disadvantages:

- * Design complexity – significant conflicts with existing utilities
- * Anticipated to be the most costly control strategy
- * Anticipated to be the most disruptive to the local residents and businesses as construction will be throughout entire Old Town area
- * Will take longer to implement
- * Additional stormwater discharges to be regulated

Green Infrastructure



Bioswales



Rain Gardens



Planter Boxes



Permeable Pavement



Rainwater Harvesting



Downspout Disconnects

Green Infrastructure

Advantages:

- * Reduces the stormwater entering the combined sewers
- * Provides ancillary environmental and community benefits

Disadvantages:

- * May not achieve bacteria reduction requirements as a stand-alone strategy
- * Highly site specific – existing soils, utilities, and community needs will dictate effectiveness.
- * Disruptive to local residents and businesses as multiple projects will be required
- * Will take longer to implement

Disinfection



NYC: Spring Creek CSO
Disinfection Facility



Detroit: Hubbell-Southfield
CSO RTB

Disinfection

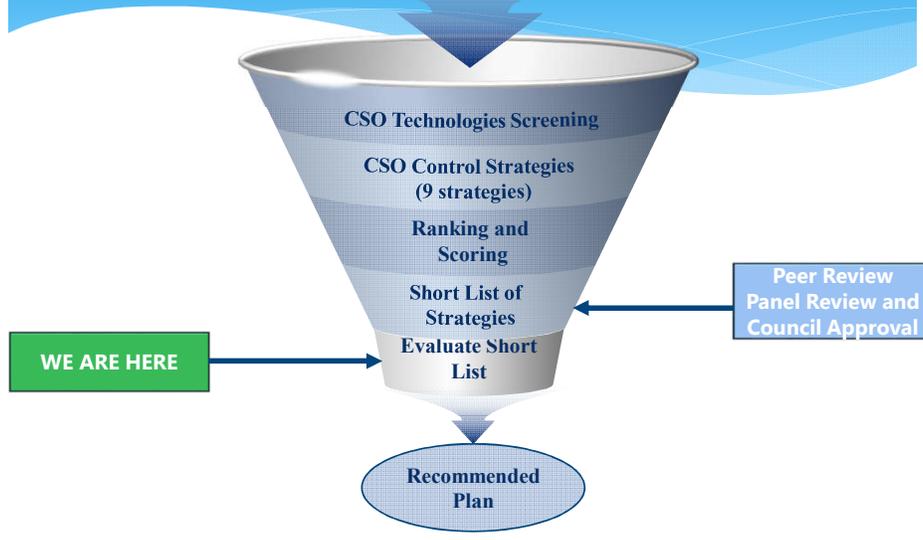
Advantages:

- * Disinfects (i.e. kills) the bacteria associated with the combined sewer overflow
- * Smaller footprint than storage tanks

Disadvantages:

- * May be difficult to site due to lack of available space
- * Easement acquisition likely required
- * Requires storage of chemicals in an urban/residential area (chlorine)
- * Requires significant electrical infrastructure (UV)
- * Does not reduce volume of combined sewer overflows
- * Does not treat other pollutants and nutrients

Long Term Control Plan Update Decision Process



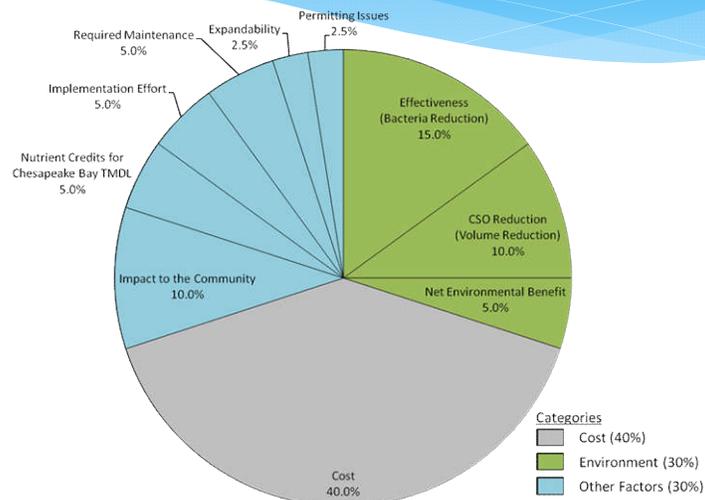
Evaluation Criteria

City's Evaluation Criteria

- Cost (20 year lifecycle)
 - CSO Reduction (volume)
 - Effectiveness
 - Disruption to the Community
 - Implementation Effort
 - Public Acceptance
 - Expandability
 - Net Environmental Benefit
 - Potential Nutrient Credits for Chesapeake Bay TMDL
 - Permitting Issues
 - Required Ongoing Maintenance
- **Assigned weighting**
 - **Ranked combined sewer control strategies based on criteria**



Evaluation Criteria Weightings



Combined Sewer Control Strategy Rankings

Rank	CSO Control Strategy	Score
1	Separate Storage Tunnels	3.98
2	Storage Tunnel for Hooffs Run and Storage Tank at Royal Street	3.97
3	One Storage Tunnel	3.86
4	Separate Storage Tanks	3.76
5	Storage Tunnel for Hooffs Run and Disinfection at Royal Street	3.69
6	One Storage Tunnel (relocate outfalls to the Potomac)	3.68
7	Separate Disinfection Facilities	3.34
8	Green Infrastructure	3.13
9	Complete Sewer Separation	2.10

Long Term Control Plan Update Overall Strategy



Where Are We Today?

- * May 2015 – City Council approved store and treat as the primary combined sewer control strategy as part of an overall strategy
 - Total of three store and treat primary strategies to be considered
 - Green infrastructure to be incorporated as a complementary strategy
 - Other complementary strategies to be evaluated
- * June 2015 – CSS Stakeholder Group to be formed to provide input on recommended final plan
- * Fall 2015 – Begin evaluation of primary and complementary combined sewer control strategies

City of Alexandria, Virginia

Questions?



Combined Sewer System (CSS) Long Term Control Plan Update (LTCPU)

List of Presentations/Outreach

Upcoming Presentations

#	Date	Presentation Title	Audience	Agenda
1	October 7, 2015	CSS Stakeholder Group Meeting No. 1	CSS Stakeholder Group	CSS/CSO Background, why the City needs the LTCPU and Control Strategy Shortlist
2	November 2, 2015	CSS Stakeholder Group Meeting No. 2	CSS Stakeholder Group	CSO Alternatives, Green Infrastructure Overview
3	January 2016	CSS Stakeholder Group Meeting No. 3	CSS Stakeholder Group	Green Infrastructure Strategy, Site and Alignment Update
4	February 2016	CSS Stakeholder Group Meeting No. 4	CSS Stakeholder Group	Site and Alignment Recommendations, Sizing Recommendation
5	March 2016	CSS Stakeholder Group Meeting No. 5	CSS Stakeholder Group	Combined Sewer Outfall 001
6	April 2016	CSS Stakeholder Group Meeting No. 6	CSS Stakeholder Group	Recommended CSO Strategy, Implementation Plan
7	June 2016	CSS Stakeholder Group Meeting No. 7	CSS Stakeholder Group	Draft LTCPU