# Combined Sewer System and the Long Term Control Plan Update
## CSS Stakeholder Group – Meeting Notes
*Meeting #3 –January 7, 2016*

| Meeting Attendees | |
|---|---|
| ***CSS Stakeholder Group*** | ***City of Alexandria*** |
| Skip Maginniss | Bill Skrabak |
| Rich Brune | Lalit Sharma |
| Lee Hernly | Erin Bevis-Carver |
| Stacy Langsdale *(absent)* | |
| Kate Mackenzie | ***Greeley and Hansen LLC (engineering consultant)*** |
| Elizabeth McCall | John McGettigan |
| Stephen Milone | Dustin Dvorak |
| Randy Randol | John Cassidy |
| Brett Rice *(absent)* | |
| Dixie Sommers | ***Clyde Wilber LLC*** |
| Jack Sullivan | Clyde Wilber |
| Tom Walker | |
| Chuck Weber | ***Waterford, Inc.*** |
| | Paul Coelus |

The meeting convened at 7:00 pm with welcome comments by City staff member, Lalit Sharma.

The Ad Hoc Combined Sewer System Plan Stakeholder Group (Group) members began by reviewing and accepting the meeting notes from the Group meeting held November 2, 2015. The agenda for the meeting was introduced and Greeley and Hansen engineering consultant John McGettigan opened the meeting with a technical presentation.

Highlights from the meeting are listed below:

- Lalit Sharma provided an introduction to the technical presentation explaining the City's overall strategy as well as the primary and complementary strategies.
- John McGettigan then explained the work done as part of the infrastructure sizing analysis. The smallest size evaluated (8-foot diameter tunnel and 2.0 million gallon tank) meets the EPA's Combined Sewer Overflow Control Policy of 4-6 overflows per year and 85% capture of the system's flows based on a typical rainfall year (1984). In addition, larger sizes of the tunnels (10-foot and 12-foot) and tanks (3.0 million gallons and 4.0 million gallons) were analyzed to determine the impacts on the number and volume of overflows.
- In addition to analyzing larger sizes it is also important to evaluate different climate periods. Along with the typical rainfall year of 1984, a recent time period (2004-2013) was also evaluated to look at the impacts of recent weather and potential climate change. As a result of this evaluation a curve was developed showing that diminishing returns on investment, measured by the number of overflows, occur in the 8 to 12-foot diameter tunnel range. Likewise the same diminishing returns occur in the 2.0 to 4.0 million gallon tank size.
- Mr. McGettigan then went on to describe what it would take to eliminate all overflows during the 10-year time period. If the City were to construct a tunnel it would have to be 52-feet in diameter; this would require a 120-foot diameter dropshaft and over an acre of construction laydown area. This means that if a tunnel this size were to be constructed in the vicinity of Hooffs Run and Royal Street, the City would need to purchase private

property and raze the buildings. Alternatively, if the City were to build a tank for the 10-year period at CSO-002 it would need to be 44 million gallons. This could be thought of a tank that is 30 feet deep with an area covering 4.5 acres or nearly a City block.

- Clyde Wilber then presented how the different infrastructure sizes would impact the receiving waters (Hooffs Run, Hunting Creek, and the Hunting Creek Embayment) in terms of water quality. As a result, unless all the other controls required in the Hunting Creek Bacteria TMDL are implemented (including 85-98% removal of stormwater load, 100% removal of human and septic load, and 50% removal of wildlife load), then construction of the proposed infrastructure will have little discernable impact on water quality.
- If all the other reductions from the Hunting Creek Bacteria TMDL are implemented, constructing the smallest proposed infrastructure (8-foot diameter tunnel and 2.0 million gallon tank) will result in twelve (12) events in which beach advisories still occur, based on the water quality modeling done at the bridge over Hunting Creek on the George Washington Parkway. Constructing any of the larger proposed infrastructure could potentially result in the elimination of two (2) of those events.
- The Group discussion question related to the infrastructure sizing was then presented to the Group for discussion. A summary of that discussion is presented on the following pages.
- Bill Skrabak then presented the City's proposed Green Infrastructure Strategy. This included two (2) options: implement green infrastructure city wide without a commitment in the LTCPU, or implement green infrastructure city wide with a commitment in the LTCPU. City staff is recommending a commitment in the LTCPU and asked for feedback from the Group on what that commitment should be and how it should be measured. A summary of that discussion is presented on the following pages.

Meeting was adjourned at 9:20 pm.

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The following is a general summary of the questions and discussion from the CSS Stakeholder Group and the response provided by City staff and their consultants. This summary discusses the general concepts and not the individual questions verbatim.

*Since the tunnels are sized for 4-6 overflows during the Typical Year, what happens if there are more than that on any particular year?*

The USEPA Combined Sewer Overflow Control Policy provides guidance for combined sewer system communities when developing their long term control plan. Specifically, this policy states that permittees shall meet specific requirements "*…such as performance standards for the selected controls based on average design conditions.*" This means that the infrastructure proposed as part of the LTCPU should be evaluated against average rainfall conditions and in this specific case the typical year. The typical year (1984) was determined by evaluating the last 40 years of rainfall against different characteristics including number of rainfall events, volume, intensity, duration, back-to-back events, etc. The City drafted the *Typical Year Selection Technical Memorandum* and submitted it to the Virginia Department of Environmental Quality (VDEQ) in September 2014. A copy of this memorandum can be found on the City's website (http://www.alexandriava.gov/Sewers).

Rainfall in the City varies from year to year and therefore the number of combined sewer overflows will vary as well. However, from a regulatory perspective the performance of the proposed infrastructure will always be evaluated against the typical year. The City has evaluated more recent rainfall conditions and noticed that larger storms occur more frequently, this is one of the driving factors for evaluating larger tunnel sizes with the goal of maintaining 4-6 overflows regardless of the rainfall that occurs during any particular year.

*What is the largest tunnel diameter that can be constructed in the areas we are looking at? Can a custom tunnel diameter be constructed? Can the tunnel be enlarged at a later date?*

For most tunnel projects, a tunnel boring machine (TBM) is lowered down a dropshaft to a depth where the tunnel will be constructed. This dropshaft must be large enough in diameter to accommodate the TBM. For the projects under consideration and the constraints of the Old Town area, it would be extremely difficult to construct dropshafts associated with a tunnel diameter larger than 12-feet. While we show tunnel diameters of 8, 10, and 12-feet it is possible to construct custom sizes in between, however a custom diameter would require a custom machine to be built and would likely increase construction costs. The diameters above are typical tunnel diameters and contractors that perform this work routinely have those sized machines.

The diameters above have specific volumes for the length of tunnel we are evaluating (the length and alignment will be presented at the next meeting in February). If we were to construct the smallest tunnel size and additional tunnel volume were required at a later date, it would be very expensive to extend the tunnel. If there is a concern that the tunnel size should be bigger, it would make more sense and be much cheaper to construct the larger tunnel size now.

*Can the tunnel be constructed in the Hunting Creek Embayment?*

The tunnel can be constructed nearly anywhere; its alignment is only limited by the location of the dropshafts. One issue with constructing part of the alignment in the embayment is that you could not have the tunnel dead end in the embayment. Tunnel boring machines typically only operate in one direction so if the tunnel were to dead end in the embayment a dropshaft would have to be constructed in the embayment to retrieve the tunnel boring machine.

*How were costs developed – what time period and inflation rate were used?*

The cost ranges presented for the tunnels and tanks were developed utilizing information from various tunnel and tank projects around the nation, including the tunnels under construction as part of DC Water's LTCP and storage tanks constructed at the Noman M. Cole Pollution Control Plant in Lorton, VA and Alexandria Renew Enterprises. Capital costs were calculated were first calculated and from that the Net Present Worth was calculated over a time period of 20 years at a rate of 3%. These costs include capital costs, project costs, land/easement acquisition, operation and maintenance costs, and contingencies. The range of costs presented represent -30% to +50% of the estimated costs; this is an acceptable range for the conceptual level of planning currently under way.

*Are the proposed tanks at CSO-002 going to be above ground or underground?*

Similar questions to this were asked at the LTCPU Public Meetings on February 5, 2015 and June 18, 2015. The public indicated a strong opposition to above ground tanks. While it may be cheaper to build an above ground tank, the design and analysis of tanks at CSO-002 has been performed assuming underground tanks. It is the intention at this time that any tanks constructed as part of the LTCPU will be underground. More information about the CSO-002 tanks will be presented at Meeting #4 on February 4, 2016.

*What are the current permit requirements related to green infrastructure? What are the developer requirements?*

In the City's current Combined Sewer System Permit there are three (3) distinct green infrastructure. The first requires the City "*…evaluate the practicality of incorporating green infrastructure during major maintenance/enhancement projects at all city facilities located within the CSS.*" The second requires the City to construct a green infrastructure pilot project in the CSS. The third requires the City to develop and implement a green infrastructure database to manage information on all green infrastructure practices put in place that are owned and/or maintained by the City.

For new development in the CSS, the City requires the developer to treat all stormwater on their site to satisfy the City's stormwater requirements and meet the Chesapeake Bay regulations. Although this can be done with green infrastructure that may provide other ancillary benefits and the City encourages it, the implementation of green infrastructure for new development is not mandatory.

Questions and feedback from the public who attended the meeting included the following:

*Once the tunnels and tanks are constructed what amount of rainfall will cause an overflow?*

An extensive evaluation has been performed on the rainfall over the past 40 years for the City of Alexandria to determine average rainfall conditions. These average rainfall conditions were used to size the tunnels and tanks such that they would allow only 4 overflows.

The table below attempts to summarize how much rainfall will be captured before the overflow begins:

| Tunnel Diameter (feet) | Tank Volume (million gallons) | Approximate Rainfall Stored (inches) |
|---|---|---|
| 8 | 2.0 | 1.50 |
| 10 | 3.0 | 1.70 |
| 12 | 4.0 | 2.50 |

Other feedback from the public meeting came from Yvonne Callahan, president of Old Town Civic Association, who stated that she and others have been taking an inventory of alleys in the City that could be utilized for the green infrastructure pilot projects. Staff is following up with her regarding this.

***Infrastructure Sizing Analysis Discussion:***
***The Stakeholders were asked for their comments on the following:***

*The City, and their consultant, have identified the minimum infrastructure sizing necessary to satisfy the regulatory requirements. We have presented the benefits, limitations, and costs associated with increasing the sizing of the infrastructure. Do the benefits justify the additional costs? What benefits and drawbacks are there from the community's perspective to these options?*

**Infrastructure Sizing Analysis Discussion Responses**

- Rich Brune: A 10-foot diameter tunnel should be the minimum size. This provides some buffer for uncertain future regulatory requirements and the cost is not that much more.
- Jack Sullivan: A tunnel instead of a tank would be the preferred option at CSO-002. The tunnel should be 10-feet in diameter for the same reason that Rich Brune discussed.
- Chuck Weber: A buried tank for CSO 002 would be preferred over an aboveground tank and is less costly than the tunnel based on the information presented.
- Elizabeth McCall: A 10-foot diameter tunnel is preferred due to the future regulatory uncertainty and the potential to assimilate future climate change.
- Lee Hernly: 10-foot diameter tunnels for both CSO-003/004 and CSO-002 would be better than a tank at CSO-002.

- Randy Randol: The City shouldn't spend any more money than they have to. The 8-foot diameter tunnel and green infrastructure are preferred over the larger tunnel sizes. Also supports linking the tunnels as opposed to separate tunnels.
- Kate Mackenzie: The tunnel should not be any larger than 10-feet in diameter. Alternatively, believed City could build an 8-foot tunnel to save money and spend that savings on green infrastructure.
- Stephen Milone: A 10-foot diameter tunnel should be the minimum size. It looks like a 12-foot tunnel is where diminishing returns occur. Since the tunnel can't practically be expanded at a later date it makes sense to build the largest size to incorporate regulatory uncertainty and future climate change. If something less than 12-foot is selected, than that money saved should be spent on green infrastructure. Needs to see impacts on sewer rates.

***Green Infrastructure Strategy Discussion:***
***The Stakeholders were asked for their comments on the following:***

*What are your thoughts on the proposed Green Infrastructure Strategy? Do you have any other suggestions or recommendations?*

**Green Infrastructure Strategy Discussion Responses**

- Dixie Sommers: Does having a commitment for Green Infrastructure in the LTCPU provide more leverage with VDEQ? We need more information about the level of commitment to make an informed decision on this topic.
- Steve Milone: One measure of commitment in the LTCPU could be the number of trees planted and area of the tree canopy.
- Randy Randol: City should look for opportunities for green infrastructure related to other construction projects.

The next CSS Stakeholder Group meeting will be **Thursday, February 4, 2016 from 7-9 pm** in the Sister Cities Conference Room 1101.