

Annual Update

February 2017

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HRSD Reports Progress on Sanitary Sewer Overflow (SSO) Reduction Program

Chris Wilson, P.E.
Brown and Caldwell

HRSD held its annual meeting to review the status of the Regional Wet Weather Management Plan (RWWMP) on January 24, 2017. The public was invited to attend this session, which included information about the extensive cooperation between HRSD and the localities it serves. The wastewater system in the Hampton Roads region includes city and county (locality) owned local sewer collection systems and pumping stations, as well as HRSD owned regional pipelines, pumping stations and treatment plants.

HRSD is engaged in a multi-year effort to reduce sanitary sewer overflows (SSOs) in the Hampton Roads area. These overflows occur when the system is overloaded with excess storm water or groundwater that enters the system during rain events, or when pipes or pumps fail due to unexpected mechanical problems or pipe breaks. The SSO reduction program includes wide-scale monitoring of wastewater flows, pressures and rainfall; development of a computer model of the pipe network; inspection and, when needed, repair of the system's many assets (pipes and pumping stations); and development of a RWWMP. The RWWMP will identify projects to enhance the capacity of the regional system up to the selected level of service.

In 2016, HRSD has continued implementing the tasks in the Third Amended Consent Decree with the United States Environmental Protection Agency (EPA) and Virginia Department of Environmental Quality (DEQ) to submit the RWWMP by October 1, 2017.

Following completion of an updated round of flow monitoring, pipeline condition assessment and sewer system modeling activities in the locality systems in 2015, HRSD spent much of 2016 preparing the Alternatives Analysis Report using

its regional computer model for the planning of capacity improvements necessary to achieve three Levels of Service to minimize SSOs. Models of the locality systems were also more fully developed and capacity improvements identified in those systems. Costs were estimated for the regional and locality capacity improvement solutions along with the cost of rehabilitation of many leaking sewer systems in the region. Using an SSO reduction benefit analysis, HRSD has determined that a 4-year Level of Service can be obtained in the regional sanitary sewer system at an approximate cost of \$2 billion. This information, along with benefits, cost, and proposed schedule for implementation was submitted to the EPA and DEQ in an Alternatives Analysis Report on August 1, 2016. Following the submittal of the Alternatives Analysis Report, HRSD is working to refine the list of capacity improvements and will work to prepare the RWWMP and submit it to the EPA and DEQ not later than October 1, 2017. HRSD will continue to consult with the localities throughout the RWWMP development process.

The Alternatives Analysis Report presented EPA's Integrated Planning Framework and incorporated the Sustainable Water Initiative for Tomorrow (SWIFT). SWIFT will purify water at seven of HRSD's treatment plants and, rather than discharge it into local waterways, use it to replenish eastern Virginia's groundwater supply. This reduction in surface water discharges will dramatically decrease the amount of nutrients that currently reach the Chesapeake Bay via treated wastewater. Because of the many environmental benefits offered by SWIFT, HRSD is proposing to prioritize this investment before most of the work on the RWWMP. HRSD will implement approximately \$200 million worth of high priority RWWMP projects while SWIFT is constructed through 2030. The remainder of the RWWMP projects will be implemented after SWIFT is completed.

Have you heard about SWIFT?

Deciphering HRSD's Sustainable Water Initiative for Tomorrow

Molly Bertsch
HRSD Community Educator

If I were to ask you what areas of the United States are facing water crises, your thoughts would probably veer toward drought-prone southern California or Texas. New Orleans might come to mind, with its flooding issues and precarious below-sea-level vantage point. But we're ok in Hampton Roads! Nothing to worry about in our water-rich neck of the woods; we're surrounded by bridges and tunnels and rivers galore! And we're definitely not like New Orleans with a "too much water" problem, right?

Sadly, Hampton Roads IS facing a water crisis- it's just invisible. The Potomac aquifer, eastern Virginia's largest water supply, is being overused and is shrinking beneath our feet. Groundwater-using industries are facing increasing regulations and new water-using industries are being told not to move to the region. The compacting aquifer is also contributing to land subsidence, which in turn is increasing the area's susceptibility to the negative impacts of sea level rise. Hampton Roads is the second largest population at risk for [the negative impacts of sea level rise](#), right behind infamous New Orleans. It's not a pretty picture.

So what do we do? How do we combat such an extensive, multi-faceted issue? Do we build flood walls? Elevate our homes on stilts? Move? There's no one-size-fits-all solution, and there are many individuals and organizations working on the problem. HRSD is one of those organizations, and it's tackling the situation head-on with an initiative that not only addresses the shrinking Potomac aquifer and land subsidence, but one that will help achieve Chesapeake Bay restoration goals and support our economy at the same time.

HRSD currently discharges approximately 150 million gallons of highly treated water into the waterways of Hampton Roads each day. Rather than continuing to waste this valuable resource, the [Sustainable Water Initiative for Tomorrow \(SWIFT\)](#) would take the water that would otherwise be discharged into the Elizabeth, James or York rivers and purify it through additional advanced water treatment to produce drinking-quality water. The purified water would then be treated to match the existing groundwater chemistry and added to the Potomac Aquifer. Hydraulic modeling suggests that this could reduce the effects of sea level rise by up to 25 percent and positively impact nearly the entire Potomac aquifer, as far north as Maryland and south beyond the North Carolina border.

SWIFT would also benefit the Chesapeake Bay. Replenishing groundwater with HRSD's purified water would effectively eliminate more than 90 percent of HRSD's discharge to local waters- [reducing the total amount of nutrients such as phosphorous and nitrogen](#) reaching the receiving streams, and ultimately the Bay. And the homes and industries in eastern Virginia that currently remove approximately 155 million gallons of groundwater from the Potomac aquifer every day would have a renewable source of groundwater to rely upon rather than an increasingly restricted one.

Extensive environmental and economic benefits aside, why is HRSD pursuing SWIFT in the first place? Its mission is to treat wastewater effectively, not to produce drinking-quality water and add it to the ground. Increasing regulations play a part; HRSD is continuously making process-level upgrades to its thirteen wastewater treatment plants to remove more and more nutrients and other

contaminants from the highly treated water it discharges. By leaping forward under the assumption that the increasingly stringent regulations will continue, the next logical step would be to purify its water to the point that it's clean enough to drink. Subsequently dumping such a valuable resource back into surface waters that don't need it when technology exists to use it in a way that is regionally beneficial... well that just doesn't make sense.

Secondly, HRSD is pursuing SWIFT because it recognizes that it's part of the big picture. Land subsidence, shrinking groundwater supplies and rising seas are problems that impact ALL Hampton Roads' residents, not just a select few. They are not problems that will go away if they're ignored, nor are they problems with easy solutions. HRSD's mission may be treating wastewater, but its vision is that future generations will inherit clean waterways and be able to keep them clean. SWIFT boldly meets that vision by protecting the Chesapeake Bay, securing future groundwater supplies, addressing land subsidence and helping the economy. Those are things I think we can all stand behind.



HRSD General Manager Ted Henifin pumps the first taste of SWIFT purified water on September 15, 2016.

How is HRSD Working to Reduce SSOs?

Molly Bertsch
HRSD Community Educator

HRSD is continuously upgrading its facilities to ensure its ability to protect the waterways of Hampton Roads effectively. In fact, it has a detailed 10-year Capital Improvement Plan dedicated to the cause, which includes 157 projects and \$1.52 billion worth of funds. It may seem costly, but these upgrades and improvements translate to serious environmental and public health benefits- including reducing the likelihood of SSO's. The Virginia Initiative Plant (VIP) is one of HRSD's facilities currently undergoing major construction upgrades, with a \$156 million project that will enhance the facility's ability to remove nutrients (nitrogen and phosphorus) from wastewater, increase the hydraulic capacity so it can treat additional flows during storms, and replace aging equipment to improve operations.



The Virginia Initiative Plant in Norfolk
(click photo for video).

Improved Nutrient Removal—VIP, placed in service in 1948 as the Lamberts Point Plant, was expanded in the late 1980s and renamed for its Virginia Initiative Process, a seasonal biological nutrient removal process patented by HRSD and its design engineer CH2MHILL. This process placed HRSD at the forefront of efforts to reduce nutrient discharges to the Chesapeake Bay. Today, HRSD is adding a 5-stage biological Enhanced Nutrient Removal (ENR) process at VIP meet new government mandates to further reduce the amount of nitrogen and phosphorus discharged to the Bay.

Increased Hydraulic Capacity—VIP's systems are being upgraded so the plant can treat a greater volume of wastewater during heavy rains, when the amount of water conveyed to the plant usually increases. The peak flow

capacity of the plant is being increased from 80 million to 100 million gallons per day. This will help reduce the possibility of SSOs during major storms.

New Equipment to Enhance Operational Effectiveness—Some of the plant's equipment installed in the 1980s expansion, while well maintained over the years, is nearing the end of its useful life and requires replacement. This project includes the addition of powerful new generators so the plant can continue to operate if electricity is not available, and upgrades to the incinerator to ensure HRSD can meet strict new Clean Air Act standards.

The major upgrade at VIP is just one of the sizeable projects HRSD has undertaken to protect the public health and environment of Hampton Roads. But you don't have to have a detailed Capital Improvement Plan to do your part to reduce the likelihood of SSOs in our community! **You can be a Sewer Steward yourself by following a few easy steps at home:**

Tips to Prevent SSOs:

- 1. NO GREASE DOWN THE DRAIN.** *Fats, oils and grease cling to pipe walls and over time, lead to blockages.*
- 2. DON'T FEED THE GARBAGE DISPOSAL.** *Garbage disposals break food scraps into smaller pieces, which build up on pipe walls and eventually block the flow of wastewater.*
- 3. DON'T USE THE TOILET AS A TRASHCAN.** *Only flush the 3 Ps: Pee, Poo, and Toilet Paper. Items like wipes and other hygiene products are regularly found in clogged pipes and broken pumps and should go in the trashcan.*
- 4. AVOID PLANTING ANY TREES OR SHRUBS NEXT TO YOUR SEWER LATERAL.** *Roots see a sanitary sewer lateral as a highly nutritious water source and will find their way inside it causing blockages and backups while growing.*

Get more tips at askHRgreen.org

Regional Wet Weather Management Plan

Annual Update

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Locality Team Participants

- Chesapeake
- Gloucester
- Hampton
- Hampton Roads Planning District Commission
- HRSD
- Isle of Wight
- James City Service Authority
- Newport News
- Norfolk
- Poquoson
- Portsmouth
- Smithfield
- Suffolk
- Virginia Beach
- Williamsburg
- York County

Help Protect Our Waterways by Reporting Suspected Sanitary Sewer Overflows (SSOs)

Please call the number listed for your locality if you observe an SSO.

Locality	During Business Hours	After Business Hours
Chesapeake Public Utilities	757-382-6352	757-382-3550
Gloucester Public Utilities	804-693-4044	804-693-3890
Hampton Public Works	757-727-8311	757-727-8311
Isle of Wight Public Utilities	757-365-6284	757-357-2151
James City Service Authority	757-229-7421	757-566-0112
Newport News Public Works	757-933-2311	757-926-8195
Norfolk Public Utilities	757-823-1000	757-823-1000
Poquoson Public Works	757-868-3590	757-868-3501
Portsmouth Public Utilities	757-393-8561	757-393-8561
Suffolk Public Utilities	757-514-7000	757-514-7000
Town of Smithfield Public Works	757-365-4200	757-357-2151
Virginia Beach Public Utilities	757-385-1400	757-385-3111
Williamsburg Public Works and Utilities	757-220-6140	757-220-6196
York County Public Works	757-890-3750	757-890-3773

