

POTOMAC WATERSHED ROUNDTABLE
Quarterly Meeting – January 5, 2018
Warrenton Visitor’s Center, Warrenton, VA

MINUTES

Members and Alternates

Hon. Penny Gross, Chair, Voting Member, Fairfax County
Deirdre Clark, Voting Member, John Marshall SWCD
Kirsten Conrad, Advisory Member, Virginia Cooperative Extension
Debbie Cross, Advisory Member, Virginia DCR
Hon. John Flannery, Voting Member, Loudoun SWCD
Laura Grape, Voting Alternate, Northern Virginia SWCD
Paul McCulla, Voting Alternate, Fauquier County
Jim McGlone, Advisory Member, Virginia DOF
Daniel Moore, Advisory Member, Virginia DEQ
John Odenkirk, Advisory Member, Virginia DGIF
Karen Pallansch, Voting Member, Water and Wastewater
James Patteson, Voting Alternate, Fairfax County
Hon. John Peterson, Voting Member, Northern Virginia SWCD
Greg Prelewicz, Voting Member, Water and Wastewater
Rebecca Shoemaker, Advisory Member, Virginia DEQ
Michael Trop, Voting Alternate, John Marshall SWCD
Hon. Elizabeth Ward, Voting Alternate, Prince William SWCD
Hon. Bob Wernsman, Voting Alternate, Tri-County City SWCD

Interested Parties

Maria Harwood, Northern Virginia SWCD
Nicholas Kuttner, Potomac Riverkeepers Network
Hunt Loftin, Gannett Fleming
Wendy Merwin, John Marshall SWCD
Marta Perry, Tri-County City SWCD
Jerry Peters, Northern Virginia SWCD
Joe Rossetti, Virginia DOF
Asad Rouhi, Northern Virginia SWCD
Heather Shackley, Northern Virginia SWCD
Mary Sherrill, Fauquier County Water and Sanitation Authority
David Ward, Loudoun County
Kathleen Watson, Northern Neck SWCD
Brad White, Virginia DEQ

Call to Order. Ms. Gross called the meeting to order at 10:06 AM and thanked the John Marshall Soil and Water Conservation District for hosting the meeting.

Introductions.

Minutes. A **motion** (Peterson-Ward) passed unanimously to approve the minutes from the October 6, 2017 meeting in Leesburg, VA.

Updates from the Chair. Ms. Gross noted that she was unable to attend the Local Government Advisory Council (LGAC) meeting in December. However, she did attend the Virginia Association of Counties (VACo) annual conference in November. She participated in a panel discussion on stormwater with David Bulova. It was noted that smaller, more rural counties are concerned about the economic impact the stormwater rules and regulations will have within their communities.

Ms. Gross also distributed copies of a recent Washington Business Journal article featuring Karen Pallansch, who was featured as one of the region's *Woman Who Means Business* for her innovative work at Alexandria ReNew. Ms. Gross asked Ms. Pallansch to talk about some of the issues wastewater treatment facilities deal with during the winter months. Ms. Pallansch shared that microbiology is used as part of the treatment process and in the cold, they get slow and sluggish, so it is difficult to maintain limits. Costs are slightly higher because of a need to use chemicals. Also, the cold air can get into the Combined Sewer Overflow and push odors up.

Mr. Prelewicz mentioned that the cold is causing old pipes to break. In addition, freezing of the water at the intakes is causing clogging. Tracking the temperature at the intakes can assist in understanding potential impacts to the quantity of water receiving treatment. He shared that there is usually consistent flow throughout the year, but the system is built for the summer peak flow. When asked why Fairfax Water doesn't report on the water main breaks, Mr. Prelewicz mentioned that the information is available upon request. However, because Fairfax Water's infrastructure is relatively young, it reduces the risk of breaks. Many of the water main breaks in the region are a result of aging systems.

Member Time & Announcements. Ms. Gross invited members to provide updates. They included:

- Mr. Peterson noted that the Potomac Council met prior to the Roundtable meeting and discussed the sustainable groundwater legislation proposed by Ms. Ward. He noted that the legislation has been filed and will be carried by Senator Stuart.
- Ms. Cross shared that Mr. Matt Strickler was appointed as Secretary of Natural Resources and that Mr. Clyde Cristman was reappointed as Director of the Department of Conservation and Recreation.
- Mr. McGlone shared that Ms. Bettina Ring will serve as the incoming Secretary of Agriculture and Forestry. He noted that Ms. Ring was the former Director of the Department of Forestry and is a strong supporter of urban forestry initiatives.
- Mr. Prelewicz noted that the American Water Works Association (AWWA) is focused on advocacy for farm bill authorization, with strong support for funding the work of Soil and Water Conservation Districts (SWCDs) as a means of protecting drinking water sources. He noted that Fairfax Water is particularly interested in working more closely with SWCDs to leverage funding on initiatives with shared interest, particularly as it relates to engagement with the agricultural community.
- Ms. Grape shared that the Center for Watershed Protection will be hosting a Northern Virginia hub location in Falls Church for their 3rd annual National Stormwater and Watershed Conference on April 10.
- Ms. Gross noted that solar farms was a topic of discussion at a recent Virginia Association of Counties (VACo) meeting. Questions that localities have included, what happens when the solar farms go away and who is responsible for the remaining infrastructure. As it relates to

stormwater and watershed issues, Ms. Gross noted that there are still many issues to consider including managing the runoff associated with these newly impervious areas.

Fauquier County Groundwater Resources. Mr. Paul McCulla, County Administrator with Fauquier County government welcomed everyone to Fauquier County and thanked them for making the trip. He provided an introduction to groundwater resources that are in Fauquier County and their importance to the community. He noted that the county works in partnership with the John Marshall SWCD and the Fauquier County Water and Sanitation Authority (WSA) on water quantity and quality issues. The county is channels growth into nine designated service districts, which are provided public water by the WSA, except for the Town of Warrenton, which provides a separate source. The goal for focusing the growth along Interstate 66 and the corridors of Route 28 and 29 is to promote farmland and open space and protect the rural heritage of the locality. Mr. McCulla noted that groundwater became a primary issue in the county when it revised its comprehensive plan in the early 1990s. At the time, the county's plan include a reliance on both groundwater and surface water sources. Nine surface water impoundments were included in the plan. However, only two of these impoundments have been built, with only one being classified as a reservoir. As a result, reservoirs only provide two million gallons of water per day. Mr. McCulla acknowledged that the reservoirs are still in the comprehensive plan.

In the late 1990s, the Fauquier County Board of Supervisors determined that the county would only rely on groundwater sources for its water needs. Therefore, eight of the nine service districts are served by groundwater reliant systems across three geological provinces, which have different characteristics for groundwater retention. The underlying geology is a fractured flow system, which makes it susceptible to surface water contamination and change over time. For example, the Louisa County earthquake in 2011 caused a shift in subsurface geology that resulted in a loss of capacity by 13 feet.

In addition, Mr. McCulla shared maps with the general location of roughly 100 community water system withdrawals and thousands of residential groundwater withdrawal points. These private facilities also put pressure on the availability of water in the municipal service districts.

Monitored wells in several service districts are showing signs of contamination from surface-related sources, which is causing millions of dollars to remediate. Mr. McCulla expressed a need to be proactive in protecting the aquifer and recharge areas from contamination and development.

The county continues to identify ways for establishing budget items for hydrogeological investigations to better understand the gravity of the situation. For example, he noted that Marshall is ideally situated for development, because of its location along I-66. However, the water supply in this area is diminishing due to its geology. The county has identified six service areas to focus their efforts on groundwater management, protection, and monitoring.

Currently, Fauquier County is working with the U.S. Geological Survey to develop a soil-water balance model, monitor streams and wells, and map the aquifer. Of the average 47 inches of rain that falls in a year, roughly 8 inches is recharge back into the groundwater system. The remainder goes back into the water cycle as run off or evapotranspiration. Mr. McCulla noted that the value of this work will assist in several ways, including wellhead protections, contamination threat assessments, siting of future development, and prioritization of future well supplies. Mr. McCulla acknowledged that there are still several key issues and challenges that exist and that a

comprehensive approach based upon best available science will assist with the long-term sustainability of these resources.

In response to Ms. Conrad's question regarding the kinds of programs that are in place to alert land developer and managers to the groundwater concerns, Mr. McCulla shared that Fauquier County is working with WSA and the Piedmont Environmental Council on a public education campaign. Land use regulations are needed to develop around the wells. He shared an example of an overlay district in Augusta County, VA, which seems to be working well.

Mr. Flannery asked what authorities localities have to enforce or enact ordinance for well protection. Mr. McCulla noted that the county has worked with DEQ to enforce issues as they arise. Language in a zoning ordinance would allow for the establishment of violations and an enforcement policy. However, they are not currently in place.

In response to a question about whether the county has considered limiting building permits or issuing them with caveats, Mr. McCulla shared that developers purchase taps from WSA. However, if WSA denies the request, the developer can request a private well. At that time some caveats are given. Developments with eight or more lots require a hydrostudy for a community well, which can be expensive. In addition, 85 percent of the land must be non-residential, open space or agricultural. He noted that this has resulted in many seven lot subdivisions with significant open space.

Groundwater Resource monitoring and Characterization in Northern Virginia: A summary of recent and ongoing projects. Mr. Brad White, Piedmont-Blue Ridge Region Coordinator with the Virginia Department of Environmental Quality's Groundwater Characterization Program provide an overview of groundwater, the capabilities and benefits of the state-wide observation well network, and various studies that the program is undertaking. Mr. White explained how a well is drilled using a casing. Once the drill hits a water bearing fracture, the water rises into the well.

He likened an aquifer to an egg carton where each cell can have a different amount of storage and different number of fractures. Individual cells are divided by a no-flow boundary which can range in distance from a feet to miles. Joints form as a reduction in stress. As rocks exume from the ground, they expand creating these gaps. Joints can form vertically and horizontally. As metamorphic rocks weather, they separate to create joints, which is important for recharge. In limestone systems, the openings occur along existing fractures and planes.

Mr. White explained that an aquifer is a discrete network of fractures covered by porous material. The fractures are recharged with water from soil and weathered bedrock, surface water features, or direct inputs. Replenishments from soil and weathered bedrock are the most common in the Piedmont physiographic provinces. He noted that the incidence of fractures decrease in deeper depths. Typical well depths in the northern Virginia region is between 300 – 350 feet.

The State Observation Well Network (www.waterdata.usgs.gov/va/nwis) managed by the US Geological Survey (USGS) and the Virginia DEQ provides real-time data for 73 wells across the Commonwealth, including 20 in the Piedmont and Blue Ridge provinces. Mr. White shared an example of the data collected at the Great Meadow location, noting a downward trend for the last 10 years, which suggests that withdrawal is more than recharge. He shared another example of an observation well situated in an area where the land use changed from forested to commercial over

15 years. The data suggests that after development, the depth to water level in the well increased significantly.

Establishing monitoring wells cost \$14,000 each with low operational costs required for regular calibration. He stated that site selection is important to determine hydraulic levels throughout the aquifer instead of at a single point. He noted the benefits of the data in terms of better understanding the timing of groundwater recharge and the relationship between withdrawals, land use changes, and groundwater availability.

Mr. White shared maps of the soil-water balance that can indicate the maximum water content of an area. He noted the aquifer recharge areas across Fauquier County, experience a range in average recharge rate of 2-10 inches per year.

In addition, he shared two studies from the USGS that focus in on local groundwater stressors. In Warren County, the study suggests that “stresses on local groundwater storage within small watersheds can result in measurable changes to stream discharge.” A study of base-flow indices along Difficult Run in Fairfax County suggests that continued development and urbanization has resulted in a 50 percent reduction of baseflow exiting the system over a 20 year period and reduction in groundwater recharge. In addition, a higher concentration of septic tanks in this area show additional impacts and water quality concerns in shallow groundwater system.

Mr. White included several resources and links to studies in his presentation. He noted that several gauges have been established for more than 20 years, including 13 in the Piedmont and Blue Ridge provinces that maintain this long-term data.

Mr. Flannery and Mr. McCulla inquired about data center and the pressure they place on groundwater systems. Several have agreed to use a closed system to recycle water and utilize grey water from FWA. Each center has unique needs and may be handled differently, but it was recognized that the volume of water necessary is substantial. In regards to a question about security of wells, Ms. Sherill noted that the wells are protected with chain link and barbed wire fencing. Most vandalism is related to spray painting. None the less, more emphasis is being placed on cyber-security and enhancement have been made to the program.

Ms. Gross thanked Mr. White for his presentation and to providing the Roundtable with an informative overview of groundwater resources in the Piedmont and Blue Ridge regions.

Evaluating Bioretention Facilities – Does good maintenance, alone, guarantee optimal performance? Mr. Rouhi, Urban Conservation Engineer with the Northern Virginia Soil and Water Conservation District (NVSWCD) shared the results of a study of 90 publically-maintained bioretention facilities in Fairfax County, conducted in partnership with the Fairfax County Department of Public Works and Environmental Services – Maintenance and Stormwater Management Division. The study focused facilities that were built before and after the establishment of the new Stormwater regulations. Mr. Rouhi noted that low impact development practices are gradually taking the place of larger traditional stormwater impoundments. Currently, there are 130 publically-maintained bioretention facilities in Fairfax County and 550 privately-maintained facilities. Currently, 80-90 percent of infill developments are using bioretention facilities as their primary means of stormwater management.

The purpose of the study was to create a protocol to assess the physical and vegetative performance of these facilities and use the findings to create design and construction

recommendations that, if implemented, may decrease the frequency and costs of routine maintenance, partial facility repairs, and full rehabilitation. Mr. Rouhi shared the various components of the evaluation criteria and data organization. For each facility, the project team completed the assessment, conducted a survey, created a profile, determined infiltration rates, collected soil samples, and inventoried the plants and their conditions. These attributes were compared to those of the design plans on file and current accepted design specifications found in the Virginia BMP Clearinghouse or Stormwater Manuals.

Mr. Rouhi presented the results of the assessment which revealed that over half of the facilities assessed did not comply with their original designs for:

- Ponding depth – a feature that defines bioretention facilities and allows for the collection of water on the surface, which slowly infiltrates into the system.
- Soil media depth – this feature is the planting media and the first filtration layer of the facility. It should be a mixture of sand, silt, clay, and organic matter.
- Infiltration rates – amount of time it takes for water to move from the top to the bottom of the system.

In addition, Mr. Rouhi noted that several facilities did not have the correct design components or that those components were damaged in some way. Facilities with these concerns were reported to MSMD immediately and were resolved quickly.

The study also revealed that the use of filter fabric as a layer in bioretention facilities does not promote clogging. Mr. Rouhi attributed much of the clogging is due to fine dust caused by the crushing of concrete that may be used for the gravel layers. He recommends that gravel be washed prior to installation in the facility.

In addition, the study found several facilities were designed to receive a baseflow, or consistent flow, from a sump pump. Mr. Rouhi noted that when this is present in a system, localized failure occurs and a wetland will develop because when soil media that is rich in organic content is consistently wet, polymers form a barrier to infiltration.

The findings of the study indicate that inefficiency in performance is not a result of the current maintenance program, but lies with the facilities not being constructed per the design. Mr. Rouhi shared several recommendations for consideration based on the results of the study, including:

- Improvement in construction oversight
 - Guidelines for construction sequencing and inspection
 - Guidelines for preparing the as-built
 - Trained construction inspectors
 - Documentation (as-built) during construction including guidelines
- Local inspection certification program
- Within 6 months after construction is complete, survey/evaluate the facility using the SOP developed during this study, and at least every 5 years thereafter.
- Share the results with other DPWES divisions, private industry, and other jurisdictions.

He noted that NVSWCD is continuing these studies for any bioretention facility that enters the public inventory every year. In addition, similar assessments are being performed for permeable surfaces and other low impact development practices. Ms. Gross thanked Mr. Rouhi for his presentation and for his continued study of these facilities.

Adjournment. Ms. Gross thanked everyone for their attendance and engagement in the meeting dialogue. She expressed appreciation to the John Marshall SWCD for their hospitality. She noted that the next meeting will take place on April 13, 2018 and will be hosted by the Northern Virginia Soil and Water Conservation District. The meeting adjourned at 2:05 PM.