



Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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**EASTERN VIRGINIA GROUNDWATER MANAGEMENT ADVISORY
COMMITTEE AND THE DEPARTMENT OF ENVIRONMENTAL
QUALITY**

Virtual Meeting

**August 26, 2026
10:00 am**

MEETING MINUTES

Committee Members Present	
Dana Adkins – Chickahominy Tribe	Dan Holloway – Hampton Roads Sanitation District (HRSD)
John Aulbach – Aqua Virginia	Eric Lasalle – Smithfield Foods, Inc
Ethan Betterton – Virginia Chamber of Commerce	Dr. Kevin McGuire – Virginia Water Resources Research Center
Cathy Binder – King George Service Authority	Robert Pickett – Va Association of Soil & Water Conservation Districts – Northern Neck SWCD
Andrew Clark – Home Build Association of Virginia	Doug Powell – James City County Service Authority
Tom Dunlap – James River Association	Jonathan Rak – Virginia Department of Environmental Quality
Jason Early - Stantec	Jake Tabor – Virginia Farm Bureau
Mike Gerel – Chesapeake Bay Foundation	Andrea Wortzel – Mission H2O

Committee Members' Alternates or Designees Present	
Anthony Creech (Alternate for Dr. Karen Shelton) - Virginia Department of Health (VDH)	Ivy Ozmon (Alternate for Whitney Katchmark) – Hampton Roads Planning District Commission
Patrick Fanning (Alternate for Mike Gerel) - Chesapeake Bay Foundation	Jenny Reitz (Alternate for Dan Holloway) HRSD
Martha Moore (Alternate for Jake Tabor) – Virginia Farm Bureau	Vicki Smith (Alternate for Bob Carteris) – City of Norfolk
Jason Pope (Designee for Mark Bennett) - USGS	Jim Taylor (Alternate for Nina-Mary Butler) – WestRock

The following committee members were absent from the meeting: Rita Chandler – Accomack Northampton Planning District Commission; Joey Hiner – SERCAP; Brent Hunsinger – Friends of the Rappahannock; David Jurgens – City of Chesapeake Utilities; Kamryn Peffley – Franklin Mill; Paul Retel – City of Suffolk & Western Tidewater Water Authority; Robert Wayland – Citizen-at-large.

Technical Support Staff Present	
Brandon Bull - DEQ	Andrew Noyes – DEQ
Cecil Byles – DEQ	James Peed – DEQ
Brian Campbell – DEQ	Tanya Pettus – DEQ
Weedon Cloe - DEQ	Nicole Reungoat – DEQ
Justin Chen -DEQ	Jeanette Ruiz-DEQ
Morgan Emanuel - DEQ	Eric Seavey – DEQ
Heather Esposito - DEQ	Sadeya Tashnia - DEQ
Sam Jasinski - DEQ	Bryant Thomas - DEQ
Sara Jordan – DEQ	Timonthy Wilke - DEQ
Liz McKercher - DEQ	Ben Wojcicki -DEQ
Craig Nicol – DEQ	

Interested Parties	
Kara Alley	Patrick Larsen
Maggie Allwein	Zach LeMaster
Rita Chandler	Alex Long
Stephanie Collins	Don McCrown
Bradley Copenhaver	Peyton Moncure
Jerry Davis	Denise Mosca
Gina DeBernard	Zach Pauley
Alex Eguiguren	C. Pierce
Douglas Flemer	Chris Pomeroy
David Flores	Gregory Pelewicz
Chris French	Brian Redder
Mariya Frolove	Dave Ress
Normand Goulet	David Reynolds

William Guzik	Walter Rissmeyer
Dan Hamilton	Megan Samples
Leslie Anne Hammond	Oula Shehab-Dandan
Tara Hawkins	Tim Smith
Kelly Hengler	Michael Stites
Mary Hodge	Chris Stone
Gabriel Irigaray	Abigail Thompson
Michael Johnson	Michelle Virts
Frank Jones	David Ward
Katelyn Jordan	Matthew Wells
Nicole Keller	Karen Campblin

Meeting Notes

Welcome and Introductions:

Mr. Weedon Cloe, Manager of the DEQ Office of Water Supply, welcomed members to the first virtual meeting of the Eastern Virginia Groundwater Management Advisory Committee (EVGMAC) for the state fiscal year (FY2027). Mr. Cloe covered housekeeping details for electronic meetings, including how members of the public can comment and the requirement for committee members to be on camera at all times. He thanked everyone for attending and identified the available handouts for the meeting. Mr. Cloe called roll to establish a quorum for the meeting.

Handouts:

- Agenda

Meeting Agenda:

Mr. Cloe went over the planned meeting agenda outline.

1. Welcome and Introductions.
2. Review and Approval of 08/26/2026 Agenda.
3. DEQ Updates - Weedon Cloe.
4. *Senate Joint Resolution No. 25 Groundwater Supply East of Interstate 95 Report* (DEQ Staff)
5. Committee Members – Discussion forum
6. Public Comment Forum (not to exceed 30 minutes, speakers will each be allotted three minutes for public comment.
7. Next Meeting.
8. Wrap Up.

Approvals:

- **Agenda:** The committee approved the tentative agenda as presented.

Presentation: Brian J. Campbell, P.G., Groundwater Characterization and Monitoring Manager and W. Brandon Bull, Director, Division of Policy “*Senate Joint Resolution No. 25 Report: Findings and Recommendations.*”

Mr. Cloe introduced Mr. Brian Campbell, who gave a presentation discussing the technical findings and recommendations in DEQ’s recent report, *Groundwater Supply East of Interstate 95*, published in July 2026 pursuant to Senate Joint Resolution No. 25 (SJ25).

Mr. Campbell began by giving an overview of the Virginia Coastal Plain (VCP) aquifer system and the groundwater supply. The area the study focused on generally encompasses the VCP physiographic province and its aquifer system. This area lies east of the I-95 corridor and the Fall Zone and includes the Eastern Virginia Groundwater Management Area (GWMA), the Eastern Shore GWMA, and the Chesapeake Bay impact crater. The VCP contains multiple aquifers, including the surficial aquifer, the Yorktown-Eastover aquifer, the Piney Point aquifer, the Aquia aquifer, the Virginia Beach aquifer, and the Potomac aquifer. Withdrawals are grouped by six types; Agriculture, Commercial, Private Domestic, Industrial, Fossil and Nuclear Power/Irrigation/Mining, and Public Water Supply. The Potomac aquifer is the largest and deepest, accounting for 70% of total withdrawals. Total withdrawals are approximately 96 million gallons per day (mgd), including reported withdrawals and estimated domestic withdrawals from private wells, which are unpermitted. The main uses of the aquifer are industrial (35%), private domestic (35% and growing) and public water supply (27%). Total Eastern Shore withdrawals are about a tenth of those in the Eastern Virginia GWMA, with a higher proportion of agricultural use. The growing population of private domestic groundwater users in the VCP is projected to increase the total annual withdrawal rate by approximately 200,000 to 300,000 gallons per day, on average, each year through 2050.

Mr. Campbell then moved to discussing the historical context for the Potomac aquifer. He shared a graph highlighting two major historical and current pumping centers; the Franklin and West Point Paper Mills. Major industrial withdrawals have occurred since the early 1900s, which has contributed to the overall decline of groundwater levels to below sea level. This has caused the flow of water in the aquifer to reverse in some areas. Present-day levels and flow patterns are dominated by major industrial withdrawals and have been altered resulting in flow inward toward these major withdrawals and downward. These conditions have resulted in land subsidence and the potential for regional saltwater intrusion.

Mr. Campbell then focused specifically on the historic withdrawals and groundwater levels of the Franklin Mill (Mill). Commercial pulp and paper production began in 1938; groundwater withdrawal reporting began around 1982. From the early 1940s, when the water level was near the surface, there was a period of heavy withdrawal. Prior to 1973, groundwater levels were declining at a rate of 7-8 feet per year. At this rate, levels would have reached the top of the aquifer around 1990, which could have resulted in the dewatering of aquifer materials and a permanent loss of storage capacity. With the passage of the Groundwater Act of 1973 and subsequent Ground Water

Management Act of 1992, the rate of water-level decline slowed. The reported groundwater levels reached a low around 2009, immediately before the closure of the Mill. The closing of the Mill led to a local rebound that spread out over the region. These regional gains were stabilized through 2014-2017 when the DEQ VCP Groundwater Initiative negotiated lower annual maximum withdrawal limits for the top 14 users in the region.

Mr. Campbell then paused for questions from members of the committee. One committee member asked if the presentation would go further in detail on land subsidence and saltwater intrusion. They noted that the primary study in the report on land subsidence was done in 2013, and new technology could provide us with a better understanding of the matter. DEQ staff explained that chloride concentrations associated with the potential for saltwater intrusion would be covered later in the presentation. The SJ25 report was not focused on land subsidence itself, and DEQ is working with USGS to build out a network of extensometers to monitor potential for aquifer expansion, which should provide more information on land subsidence.

Mr. Campbell then moved to covering observed groundwater level data. He began by sharing selected hydrographs displaying the Potomac aquifer groundwater levels. Specific wells were selected for groundwater-level trend analysis. Wells located nearer the Franklin center showed that many declining trends reversed and began to rise. However, many of these have since flattened or resumed declining. Farther north, some declining trends flattened while others showed no evident response. Prior to the closure of the Mill there was an ongoing decline of 1-2 feet per year. After 2010, groundwater levels across the Potomac aquifer broadly rose and stabilized for about a decade, however around 2021, those trends stalled and began to reverse. Levels across the VCP are projected to resume declining in the next 5 to 10 years.

Mr. Campbell moved to discuss the implications for Managed Aquifer Recharge (MAR). The effects of the Franklin Mill shutdown were studied as a possible analog for MAR. Within the aquifer, pressure effects may travel tens of thousands of times faster than the typical flow of groundwater molecules. Injections into the aquifer may yield regional increases in groundwater levels with only local migration of the injected water itself. However, regional gains may be sensitive to disruption and could prove transient if injections were reduced or suspended. This complicates the forecasting of groundwater levels that could result from MAR.

Mr. Campbell paused for questions from committee members. One member asked how the monitoring wells used for the study were selected. DEQ staff explained that the wells had previously identified by DEQ as trend monitoring points, based on position, distribution, length of record, and other features of the hydrograph. Using these wells allowed for continuity with existing DEQ work. Another member noted an oscillation in average value in the 1990–2004 time frame and asked what caused it. DEQ staff attributed it to variability in water levels observed in a specific well that may be affected by interference from the nearby edge of the impact crater.

Mr. Campbell next moved to discuss the regional groundwater budget analysis. DEQ has subdivided the VCP aquifer system into 8 regions, modified from pre-existing drought evaluation regions. USGS used ZONEBUDGET software and DEQ/Aquaveo “reported use” simulations to compute a groundwater budget for each region over the modeled historical period 1890-2023 and future 2024-2073 (SWIFT effects were not included). The analysis focused on two representative

moments; 2000 and 2023. The results showed that in a confined aquifer system, groundwater generally flows inward from perimeter regions and downward from overlying hydrogeologic units. Data from the year 2000 showed a storage decrease of 340k cubic ft/day (2.5 mgd) while 2023 showed storage increase of 36k cubic ft/ day (270k mgd). Improvements in the Potomac aquifer storage rate have come at the expense of continuing decreases in the overlying units.

There is limited capacity for new groundwater withdrawals. A single additional withdrawal of 3 mgd was simulated at each of 9 locations; none passed the criteria for permitting. The maximum number of withdrawals that would pass criteria for permitting varied by region. Only the best-case estimate would support a large withdrawal.

Mr. Campbell paused for questions from committee members. One member asked for clarification that each of the withdrawals was considered independent of the others. DEQ staff confirmed that the study did not run the withdrawals concurrently. The committee member followed up by asking what the assumed daily withdrawal rate for private domestic would be in the service area. The increase is projected to be 200,000 to 300,000 gallons each year distributed across the coastal plain. Another member asked for clarification on the maximum passing withdrawal and if it was spread across the whole coastal plain, or if it was per permit. DEQ explained that the scenario modeled a single additional withdrawal at that point. Another committee member noted that max passing numbers are location specific, and moving the location simulated changes the number substantially. A committee member asked for clarification if the study used reported use or total permitted use. DEQ staff clarified that this analysis used simulations based on the total permitted use.

DEQ has updated and expanded the analyses of a 2010 USGS report on VCP groundwater quality by comparing that report's data set (1906-2007) with more recent data (2007-2024). This showed that the regional groundwater quality has been stable since 2007, which supported previous findings that groundwater quality has largely been stable since the early 20th century. It also identified locally increasing chloride concentration (salinity) trends consistent with previous USGS findings.

Localized increases in chloride concentration have been observed in some parts of Eastern Virginia and on the Eastern Shore. Groundwater sampling has revealed an increasing trend, mainly in the Potomac aquifer and Yorktown-Eastover aquifer. Most of these trends are spatially associated with known withdrawals. These observations are consistent with groundwater budget results that indicate inflow from coastal boundaries.

Mr. Campbell paused for questions from committee members. One member asked for clarification that there are no regional trends of saltwater intrusion. DEQ staff clarified that the USGS identified two potential components to tracing chloride trends. In one case, there can be localized up-coning, which is when groundwater withdrawals draw the saltwater upwards towards the withdrawal. This is potentially reversible. The second scenario is "a broad lateral regional inland movement of saltwater." It is difficult to distinguish between the two. Further study is being conducted to help distinguish between the two. There is some evidence from the model that suggests some level of localized saltwater intrusion, but there is not currently sufficient evidence to establish a regional trend.

Mr. Campbell closed by presenting the technical findings of the report. Major withdrawals, especially at paper mills, have caused inland groundwater levels to decline below sea level, inducing inward and downward flows. A sharp decrease in the Franklin Mill withdrawal, plus special management efforts, have reduced the groundwater deficit to near zero in the overall Potomac aquifer (with some regional variation). Groundwater levels in the Potomac aquifer rose and broadly stabilized until about 2021, when rising trends stalled and began to reverse. MAR has the potential to increase regional groundwater levels, but these gains may dissipate when injections cease. The VCP aquifer system currently has limited capacity for significant new withdrawals (capacity varies by region). Chloride concentrations in the aquifer system have increased locally in parts of Eastern Virginia and parts of the Eastern Shore.

Mr. W. Brandon Bull, DEQ Policy Division Director, covered the Policy recommendations of the SJ25 report.

Mr. Bull began by giving a brief background on the Groundwater Management Act of 1992. Groundwater withdrawal law is entirely state law. The first attempt at statutory regulation of groundwater withdrawals was the Groundwater Act of 1973 (1973 Act). This act established the concept of critical groundwater areas, and required permits for withdrawals. The Act of 1973 was more permissive than today's act, as it had had a much higher permitting threshold; no permit was required when withdrawing less than 50,000 gallons per day. The 1973 act also included exclusions from permitting requirements for several large categories including agriculture, livestock, human consumption, or domestic purposes. The 1973 Act was repealed and replaced with the Groundwater Management Act of 1992 (1992 Act). The Act provides the framework through which DEQ regulates the use of groundwater in declared Groundwater Management Areas (GWMA). It provides the process by which the State Water Control Board declares GWMA's. It also raised the permitting threshold to 300,000 gallons or more of groundwater in any one month in a GWMA, unless an exception applies. The 1992 Act has fewer exclusions as well.

The permit process under the 1992 act is based on need as opposed to historic usage. The Act requires in statute that the applicant make a demonstration of need and that the application includes a water conservation and management plan. Further requirements are established in the Groundwater Withdrawal Permit regulations.

The Groundwater Management Act of 1992 has achieved mixed results. The regulatory framework enabled the Commonwealth to stabilize groundwater-level gains that resulted from the unrelated closure of the Franklin Mill in 2010. The 1992 Act showed that regulation can and does work. However, groundwater supply east of I-95 is constrained, and current projections indicate decline availability in the near future.

Mr. Bull then covered the legislative and budget recommendations. The recommendations are grouped into 5 different categories. The first group of recommendations are to Amend the Act to codify and clarify DEQ's regulatory authority.

- Codify existing regulatory language providing that DEQ has the authority to deny a permit application for a new, expanded, or renewed withdrawal in a GWMA if "[t]he cumulative stabilized impact of the proposed withdrawal in a combination with all existing lawful

withdrawals will lower water levels in a confined aquifer below a point that represents 80% of the distance between the land surface and the top of the aquifer.”

- Clearly grant DEQ authority to deny a ground water withdrawal permit application or reduce the permitted withdrawal volume where alternative water sources (e.g., surface or water reuse) are reasonably available. Clarify how prioritization for human consumption and the goal of protecting existing uses should be reconciled and implemented through permit decisions.
- Prohibit DEQ from issuing permits for new significant withdrawals in portions of GWMA's located outside the extent of the applicable groundwater flow model.

Questions and comments from committee members regarding the recommendations included;

One member asked what the benefit would be to take regulatory requirements that exist within the Groundwater withdrawal permitting program and move them into statute. DEQ staff explained that statutory authority provides more certainty. There is a possibility that regulatory authority could be challenged as not being authorized by statutory authority. Adopting these requirements in statute would also clarify the General Assembly's intent.

Another committee member asked for more information on how DEQ will assess whether water reuse or surface water are reasonably available when reviewing permit applications. DEQ staff explained that it would depend on what the available alternatives are, as well as what the proposed beneficial use would be.

A committee member noted that a study conducted 2018 pursuant to HB 1186 focused on how to prioritize human consumption, and wondered if DEQ had reviewed that study. They also noted that the regulation requires DEQ to prioritize human consumption when there is a conflict, or when there is insufficient water, and if DEQ has reached the conclusion that we are in that scenario. DEQ staff explained that they did review the HB1186 report. Because the Code requires DEQ to prioritize human consumption, increased clarity is beneficial. When permitting staff conduct their reviews, they can look at the previous 12 months of highest usage to be permitted. There may be an area where there are competing uses, and it is not just the cumulative total availability that is considered. The report does not propose how prioritization should be done, but rather seeks guidance from the General Assembly.

Another committee member asked if there had been any thought given to expanding any of these concepts on a statewide scale. DEQ staff noted that in the 2026-2028 budget there is budget for DEQ to do a study of groundwater issues in western Loudoun and western Fauquier County. However, it is important to keep in mind that the 1992 Act and accompanying regulations are built around how to conduct permitting and groundwater regulation in confined aquifers. The current groundwater regulations would not translate well into fractured rock systems in the western portion of the state. If the State Water Control board declared a GWMA in the western part of the state, and thus triggered permitting requirements, there would need to be an entirely separate set of regulations developed. DEQ is also conducting a study on cooling water scarcity for data centers. Another member asked if a map of the area could be provided.

The second group of recommendations are to Address Local Government planning and groundwater availability.

- Amend Chapter 22 of Title 15.2 of the Code of Virginia to require local comprehensive plans in GWMA's to limit planned growth based on groundwater availability if no other water supply is feasible.

The third group of recommendations are related to Groundwater Trading.

- Any legislation to amend the Act to authorize groundwater trading should first address:
 - Scientific and technical consensus on the safety and reliability of groundwater trading,
 - Protection of the public right to groundwater resources,
 - Resolution of how groundwater rights are allocated,
 - Whether and how to compensate parties providing the recharge of the aquifer, and
 - Appropriation of adequate funds to support development of a groundwater trading regime and budgetary plan to pay for oversight.

The fourth group of recommendations are Budget recommendations.

- Recommend \$1,020,000 in Fiscal Year (FY) 2027 and \$720,000 in FY 2028 to DEQ for five full-time equivalents (FTEs) and the projects specified below to more effectively implement the Act:
 - \$135,000/year for 1 FTE to coordinate, analyze and act on data regarding the aquifer system and groundwater withdrawals, including lawful unpermitted groundwater withdrawals.
 - \$270,000/year for 2 FTEs to enhance DEQ's groundwater withdrawal permitting compliance program.
 - \$270,000/year for 2 FTEs to improve characterization of the VCP aquifer system, enhancing DEQ's ability to conduct technical evaluations.
 - \$45,000/year to purchase real-time monitoring equipment for observation wells to better understand changing groundwater conditions in the VCP, including recharge effects of HRSD's SWIFT Project.
 - \$300,000 to hire a contractor to study/evaluate other locations in the Commonwealth that could benefit from aquifer recharge projects like HRSD's SWIFT Project after the extent and magnitude of the full recharge volume is realized. (Completed in the 2026-2028 Budget Bill).

The fifth and final recommendation was Related to Groundwater Withdrawal Permit fees

- In addition to increasing general fund allocations, raise the statutory limit on groundwater withdrawal permit fees to an amount sufficient to initially cover at least 50% of permit costs.

Mr. Bull paused for questions from the committee. One member noted that the increase in permit fees could be costly to potential permittees.

New Business – Updates and/or Topics of Interest from Committee Members:

Mr. Cloe went around the room and asked if there were any questions, updates, or topics of interest from the Committee Members.

- Committee members requested that the agenda for the September meeting include time for the committee to discuss the recommendations.
- A committee member requested that the Power Point presentation be shared with committee members.

Action Item: DEQ will circulate a copy of the HB1186 report, a copy of the map of the groundwater area and a copy of the presentation to committee members.

Public Input Forum: Mr. Cloe asked if there was any public input. Comments and questions were provided by two individuals. Ms. Kelly Hengler of Hampton Roads Preservation asked:

- Were per- and polyfluoroalkyl (PFAs) identified and discussed in the report?
 - DEQ staff explained that the report does not directly address PFAs considerations

Mr. Chris Stone of American Academy of Environmental Engineers and Scientists asked:

- If the VCP aquifer system now has capacity for additional withdrawals ranging from 0 to 360,000 gallons per day should the state be evaluating withdrawals primarily permit-by-permit, or has the system reached a point where Virginia needs an explicit regional groundwater allocation for sustainable withdrawal budget?
 - DEQ staff explained that the modeling and the recommendations in the report identify SWIFT as something with potential. The intention is to look at SWIFT as a way to deal with individual permits. Regional allocation is a topic that the committee could discuss at the next meeting.
- The presentation showed three related concerns; groundwater levels below sea level have an inward and downward flow, chloride concentrations are increasing locally, and MAR benefits may dissipate if injections stop. What is the risk that continued pumping could produce water quality impacts, particularly saltwater migration, before groundwater level criteria alone indicate we may have a problem?
 - DEQ staff explained that is a hard risk to quantify. The chloride monitoring network expansion project is working to improve the monitoring data set so that we will be able to respond to this question in a more effective way in the near future.
- It is recommended that local comprehensive plans in the GWMA account for water availability and potentially limit planned growth where no other water supply is feasible. How would that work in practice, and what resources would DEQ supply.
 - DEQ staff explained that the Code of Virginia provides that comprehensive plans may designate areas where the implementation of reasonable measures to provide for the continued availability quality and sustainability of surface water. There is already authority there. The idea behind the recommendation is to make such designations a requirement for localities in a GWMA.

- If the Commonwealth adopts these recommendations, are we moving towards a different groundwater management philosophy from permitting withdrawals unless a specific problem can be demonstrated, requiring applicants to display affirmatively that sufficient water capacity exists?
 - DEQ staff explained that there is no simple answer to the questions. It depends on how you look at the totality of the recommendations.

Next Committee Meeting:

The next meeting of the Eastern Virginia Groundwater Management Advisory Committee will be held on September 30 at 10 a.m. The meeting will be held in person at Bank of America Building 3rd Floor Conference Room 1111 E. Main Street Richmond, VA 23219

Adjournment:

Mr. Cloe noted that all relevant material from meetings, including the meeting agenda, would be posted on Townhall. He thanked all the members of the committee, the interested public, Mr. Brian Campbell and Mr. Brandon Bull for their presentation and closed the meeting. The meeting was adjourned at approximately 12:07 p.m.