

The Potomac Aquifer Recharge Oversight Committee
Meeting Minutes
August 29, 2024

In attendance: Whitney Katchmark (Committee Chair; remote), Mark Bennett, Jay Bernas (remote), Charles Bott (remote), Sam Caldwell (remote), Brian Campbell, Weedon Cloe, Gregory Connock (remote), Curtis Consolvo (remote), Eva Doty (remote), Jason Early (remote), Robert Edelman, Dan Holloway, Preston Kirby, Mark Kram (remote), William Mann (remote), Jamie Mitchell (remote), Scott Morris, Doug Moyer, Mark Nelson (remote), Ivy Ozmon, Jason Pope (remote), Harold Post (remote), Doug Powell (remote), Leila Rice (remote), Mike Rolband, Alex Samms, Gary Schafran, Suzanne Sharkey (remote), Jake Tabor (remote), Mark Widdowson.

Ms. Katchmark (HRPDC) called the meeting to order at 11:07 a.m.

The minutes of the previous meeting were approved as distributed.

Ms. Katchmark presented research drivers, knowledge gaps, and monitoring needs to support the development of a groundwater trading program in the Eastern Virginia Groundwater Management Area (EVGMA). Expanding the state observation monitoring well network to improve groundwater level data collection across space and time and evaluating current groundwater modeling capabilities to accurately predict groundwater levels in response to withdrawal pumping and groundwater injections are needed to improve confidence in models used to inform groundwater management. She provided the ideal schedule for collecting at least 12 months of baseline groundwater level data before initiating groundwater injections at the first full-scale SWIFT project at the HRSD James River facility.

Ms. Katchmark also shared that she requested time on the next EVGMA committee meeting agenda to discuss the idea. DEQ members in attendance noted they are prohibited from discussing or proposing budget changes and that the Potomac Aquifer Recharge Monitoring Lab (PARML) strategic plan may require amendments to include the effort to enable a budget request. DEQ managers noted that completing that process within the current fiscal year is impractical.

DEQ staff also shared challenges with monitoring well installations, highlighting limitations that make installing new DEQ monitoring wells infeasible before the estimated Spring 2026 start date of James River SWIFT. They shared that it has taken two years for DEQ to complete the installation of five new monitoring wells. Dr. Widdowson (PARML) noted that the PARML strategic plan includes broad language that intentionally enables stakeholder collaboration on the effort since no individual entity can accomplish the suggested improvements alone.

Representatives from HRSD encouraged the effort and agreed that it is important to take the first critical step toward expanding the monitoring network, which could include an evaluation of existing monitoring wells to assess as state observation well candidates. Representatives from DEQ and USGS discussed the existing state observation well network. PAROC participants reiterated opportunities to expand the network by evaluating whether Locality owned monitoring wells required by DEQ could help improve spatial coverage and data collection. DEQ was asked how the EVGMA committee could collaborate with PAROC on this effort. DEQ said they would consider the idea with other EVGMA committee agenda items coming up. Mr.

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Campbell (DEQ) offered to take the lead on coordinating discussions with stakeholders to work toward building a proposal for options to expand the state observation well network by the next PAROC meeting on December 19. Mr. Rolband (DEQ) encouraged PAROC members to engage in the budget process to prepare requests by May 1 for the following fiscal year.

Mr. Cloe (DEQ) presented an overview of ongoing and upcoming DEQ groundwater studies with the committee. DEQ staff are working to expand the state observation well network, including installations of up to 20 climate response network wells in fractured-rock aquifers and up to 19 chloride monitoring wells in coastal plain aquifers. He presented maps of the existing state observation well network. He showed where monitoring data are collected discretely or continuously from existing wells around current and planned SWIFT facility locations. Mr. Cloe provided details on DEQ efforts to study groundwater supply in the Commonwealth as outlined by Senate Joint Resolution 25 (SJ25). The preliminary DEQ plan is in development and includes the following components:

- Completing annual model updates and simulations by Aquaveo (expected by September)
- Incorporating economic development and population growth projections (TBD)
- DEQ delineation of geographic regions of interest
- A zone budget analysis by Aquaveo and USGS to derive relative groundwater availability among regions
- USGS development of additional tools to illustrate groundwater levels and trends
- Compiling and analyzing available groundwater quality and trends by DEQ

Funding to complete the SJ25 study will support adding a new full-time employee to the DEQ groundwater characterization and monitoring group, enabling an internal reorganization to support the study objectives.

Mr. Cloe also presented ongoing DEQ studies of groundwater dynamics in the EVGMA North of Fredericksburg. The DEQ is funding a USGS study there this fiscal year to evaluate existing wells for future water level monitoring, conduct tracer sampling to determine groundwater age, and assess bedrock depth with passive seismic surveys.

Committee members asked for examples of DEQ groundwater zones of interest. Those areas remain to be determined and could coincide with regional water supply planning areas. DEQ representatives also noted a larger return on study investments by taking a zone budget analysis approach.

Dr. Widdowson (PARML) presented updates on the PARML strategic plan implementation and PARML monitoring and research efforts. PARML participated in DEQ meetings, attended the last EVGMA committee meeting, and plans to continue attending. PARML also participated in the annual HRSD SWIFT research meeting where students and researchers report on the water treatment and groundwater studies related to SWIFT. PARML directors are working to develop a laboratory website to inform the public about their work and groundwater activities at large in Virginia. The lab intends to use the website to host a data dashboard and recruit students interested in engaging in SWIFT research. The data dashboard will have an interactive user

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interface, enable visualization and plotting of current and historical groundwater data, and provide a calculator for volumetric storage changes in the Potomac Aquifer. Dr. Widdowson noted that PARML is working to model the breakthrough of PFOA in groundwater migration bands around the SWIFT Research Center injection site in Suffolk, VA. He shared data illustrating the breakthrough of PFOA in the upper Potomac Aquifer (UPA) monitoring well before discussing mechanisms for PFAS removal by the soil-aquifer system. Dr. Widdowson expects to publish those findings soon.

Dr. Schafran (PARML) presented updates to ongoing research investigating the adsorption or release of arsenic in underground sediment in response to SWIFT water injections. Intermittency of injection operations and variations in concentrations of treatment chemicals and SWIFT water constituents (sodium hypochlorite, dissolved oxygen, and nitrate) can shift aquifer conditions between reducing and oxidizing (redox) environments. Native groundwater is highly reduced, and SWIFT water is highly oxidized. Changes in redox potential can cause releases of arsenic adsorbed on underground sediments into solution in groundwater. PARML initiated weekly sampling of SWIFT soil-aquifer treatment (SAT) monitoring wells to better understand arsenic behavior in response to exposure to SWIFT water and during periods of pausing SWIFT water injections.

Dr. Schafran also shared that PARML and HRSD are collaborating on a manuscript on the Perfluoroalkyl Carboxylic Acid (PFCA) analytical method developed at PARML. PARML will continue to work on an adsorption model to better predict PFAS breakthrough curves in the granular activated carbon (GAC) treatment process. Part of that work will involve modeling PFOA and natural organic matter competition for sorption sites.

The committee discussed planning for the five-year review of PARML by the National Water Research Institute (NWRI). Potential review questions posed by PARML were discussed, and the committee was asked for input on refining the scope of the review. Committee members provided recommendations for panelist candidates based on their subject matter expertise. Ms. Sharkey (NWRI) joined remotely to answer questions. She provided guidance on refining the proposed review questions and the presentations PARML will give to the review panel as part of the assessment process. Ms. Sharkey recommended including the PARML strategic plan in the presentation materials packet provided to panelists before the first panel meeting date. Ms. Katchmark will circulate PARML's refined review questions for input from the committee before the next PAROC meeting. The committee will finalize preliminary review planning details at the December 19 PAROC meeting and provide details to NWRI. Ms. Sharkey noted it will take a couple of months to form the panel and a couple more to produce the panel report.

Ms. Katchmark opened a roundtable discussion. Mr. Bernas shared that the HRSD Commission approved the installation of an extensometer "superstation" at the James River SWIFT facility. A superstation is a dual-stage extensometer capable of measuring the vertical motion of the land surface at the installation site and discrete portions of the aquifer below. The timeline for installation remains to be determined, and installation work must be sequenced with ongoing DEQ and USGS efforts. HRSD has set a goal to have the James River extensometer operating before the startup of the James River SWIFT facility.

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There were no public comments.

The meeting adjourned at 1:35 p.m.

Approved:

Date:

Committee Chair

Committee Members:

- Mike Rolband, Director of Virginia DEQ
- Dr. Karen Shelton, Virginia State Health Commissioner
- Dr. William Mann, Governor Appointee
- Doug Powell, Governor Appointee
- Whitney Katchmark, HRPDC
- Dr. Stanley Grant, Director of Occoquan Watershed Monitoring Laboratory
- Dr. Mark Widdowson, Co-Director of the Potomac Aquifer Recharge Monitoring Lab
- Dr. Gary Schafran, Co-Director of the Potomac Aquifer Recharge Monitoring Lab

Non-voting members:

- Mark Bennett, Director of Virginia and West Virginia Water Science Center, USGS
- Leslie Gillespie-Marthaler, Deputy Director Water Division, US EPA Region 3