The Potomac Aquifer Recharge Oversight Committee
Meeting Minutes
September 18, 2025

In attendance: Whitney Katchmark (Committee Chair), Mark Bennett (remote), Charles Bott (remote), Brian Campbell (remote), Weedon Cloe, Greg Connock (remote), Curtis Consolvo (remote), Jason Early (remote), Bob Edelman, Dan Holloway, Preston Kirby, Mark Kram (remote), William Mann (remote), Jamie Mitchell, Bryant Mountjoy (remote), Ivy Ozmon, Harold Post (remote), Doug Powell (remote), Jennifer Reitz, Gary Schafran, Kassie Smith (remote) Mark Widdowson, Lauren Zurvansky (remote).

Ms. Katchmark (HRPDC) called the meeting to order at 11:03 a.m.

The minutes of the previous meeting were approved as distributed.

Mr. Holloway (HRSD) provided updates on baseline well water quality monitoring at James River (JR) SWIFT. The collection of baseline water quality data was driven by HRSD's need to understand native water quality to inform SWIFT operations. He reviewed monitoring well locations and well construction diagrams for the groundwater wells. He shared chemical compounds (analytes) that will be monitored to comply with the facility's Underground Injection Control (UIC) permit. He pointed committee members to the full suite of monitoring analytes listed in attachments one through three in the JR SWIFT UIC permit. HRSD adheres to strict groundwater sampling standards in monitoring efforts. They performed the baseline sampling after the constant rate tests of the wells, noting that as the best time to collect water samples that most reliably represent native groundwater in the aquifer. Results from sampling were plotted on Piper Diagrams, used to characterize water based on the concentration of ions in groundwater. Native groundwater at JR SWIFT is a sodium-chloride type with circum-neutral pH, the same type of water chemistry identified at other Hampton Roads sites explored for SWIFT, including the SWIFT Research Center (SRC). Nutrient results fell at or below detection limits. Radio nuclide results showed some minor exceedances, consistent with typical groundwater measurements in the area. Very few human-related organic compounds were detected that were associated with well-drilling fluids. Those organic compound concentrations declined with subsequent sampling (flushing) of the wells. Mr. Holloway shared that HRSD also collected water samples using methods that isolate pumping through well screens at specific depths underground. Those samples should help HRSD better understand the water character within discrete zones in the aquifer.

Dr. Widdowson (PARML) updated the committee on recent PARML activities. Virginia Tech (VT) submitted an appeal and report of their work to the EPA in a bid to restore grant funding for the lab's enhanced aquifer recharge (EAR) research. PARML is nearing a final agreement with the National Institute for Aerospace to secure additional space in their building for conducting wet lab operations. He shared that the annual SWIFT research meeting recently occurred, where graduate students shared findings from their research with HRSD, VT, and Old Dominion University (ODU) research leads. Recent push/pull well pumping tests were successfully conducted in June, and another is planned in November. Dr. Widdowson noted that the different operational conditions used in the tests are useful for comparisons. The Soil Aquifer Treatment (SAT) columns at the SRC have been constructed and are undergoing conditioning with groundwater collected from the Potomac aquifer. PARML also conducted lab tests to understand

PFAS sorption/desorption in Nansemond's native aquifer sediments, and a research manuscript on is forthcoming. PARML continues to conduct monitoring at the SRC and track the arrival of SWIFT water at the SRC monitoring wells about 1000 ft away from the recharge wells. The lab is also developing a site transport model for JR SWIFT.

Dr. Schafran (PARML) shared an update on the PARML evaluation by an expert panel convened with help from the National Water Research Institute (NWRI). A workshop is scheduled with the NWRI panelists this fall. PARML will provide presentations on their oversight functions, monitoring capabilities, and communications plans to receive feedback from the panel. PARML anticipates receiving feedback on the following questions:

1) Is PARML fulfilling its intended mission and effectively serving as the actionable arm of PAROC during the SWIFT demonstration phase?
2) Are there suggestions for improving the PARML monitoring plan for JR SWIFT, and is PARML adequately resourced and does it have sufficient capabilities to provide oversight of the SWIFT project at full scale?
3) How might PARML share the information being generated with a wider audience, including stakeholders, the general public, and the water reuse community?

Dr. Schafran reviewed the lab's existing oversight activities and monitoring requirements outlined in the UIC permit for the SRC. The UIC permit for JR SWIFT will guide the development of the PARML monitoring plan for that full-scale facility. PARML will use contract laboratories to outsource analyses that it does not have the capability to conduct. A communications plan could be developed in partnership with HRSD.

The PARML directors discussed the lab's budget compared to the budget established for the VT Occoquan Watershed Monitoring Lab (OWML). They highlighted differences between the needs of OWML and PARML, identifying different fieldwork demands for monitoring surface water versus groundwater. Funding structures were also compared in the discussion, recognizing that the OWML funding comes from localities and PARML funding comes from the Commonwealth. Committee members noted the short timeline to request budget amendments for additional PARML funding during this General Assembly session.

Dr. Connock (USGS) presented recent findings from integrated subsidence monitoring and modeling across the Virginia Coastal Plain. He reviewed the importance of vertical land motion (VLM) in coastal areas like Hampton Roads. Dr. Connock noted two main drivers for VLM in this region: post-Glacial Isostatic Adjustment (GIA) and groundwater-level declines that enable compaction of aquifer sediments. Areas with the greatest observed land subsidence in Hampton Roads coincide with major groundwater withdrawals from industries in West Point and the City of Franklin. Various methods for measuring VLM were covered: continuous, highly precise, direct VLM measurements by extensometers, and discrete measures of motion by Global Navigation Satellite System (GNSS) and Interferometric Synthetic Aperture Radar (InSAR) at lower precision but over a larger geographic area. Uncertainty in measurements collected by GNSS and InSAR methods can be reduced through the colocation of those methods with measurements by extensometers. He presented a map of the Subsidence Watch and Aquifer-system Response Monitoring (SWARM) network that combines VLM observations with groundwater level observations. The SWARM network is supported by HRSD and the Virginia Department of

Environmental Quality (DEQ), and consists of six extensometers, 10 GNSS stations, five SAR corner reflectors, and many observation wells. The extensometer undergoing installation at JR SWIFT is a dual-stage, capable of measuring two distinct zones of vertical change related to aquifer-system changes. This will enable measuring changes in the Potomac aquifer system in response to SWIFT's aquifer recharge operations and support the USGS goal to resolve the human-activity-driven component of VLM. Dr. Connock reviewed preliminary analyses of aquifer changes at the Nansemond extensometer in Suffolk, VA, showing that sediment compaction occurs when SWIFT is not injecting and sediment expansion occurs during SWIFT aquifer recharge. He presented compaction data collected at the Franklin extensometer location in response to groundwater pumping. He showed recent data from the West Point extensometer location that did not respond similarly to groundwater withdrawals. Various factors were considered to explain the differences, including precipitation and stream gauge data near that location. Dr. Connock described research efforts ongoing at USGS to develop a groundwater and compaction model that integrates VLM and groundwater monitoring data. He noted the underappreciated complexity of VLM across the Virginia Coastal Plain, which is a major contributing factor to InSAR and GNSS land elevation uncertainty. The USGS expects that the expanded SWARM network will help improve understanding and enable accurate, near real-time monitoring of VLM in the region.

Ms. Zurvansky (HRSD) shared construction updates on HRSD projects related to full-scale SWIFT facilities in planning and construction phases. Many photos, aerial images, and figures were provided to visualize ongoing efforts. After reviewing the siting of the project locations, she provided updates for each. The Boat Harbor Treatment plant will be converted to a new pump station with wet weather storage capacity. The pumps at the modified Boat Harbor facility will convey wastewater flows through force mains to the Nansemond Wastewater Treatment Plant on the other side of the river. The first phase of the Boat Harbor force main construction will be complete in November this year, and the second phase is expected to be complete by next summer (2026). The Nansemond Treatment Plant is also under construction to expand hydraulic and treatment capacity. Construction progress was reviewed in aerial photos taken between March 2023, before construction started, and September 2025. The advanced nutrient reduction improvements and expansion to a permitted capacity of 50 million gallons per day (MGD) at the Nansemond plant are expected to be completed sometime in 2026. Future construction of a full-scale SWIFT plant and installation of recharge wells on and off-site of the Nansemond facility are also planned. Substantial completion for Nansemond SWIFT is expected in March 2029. HRSD has initiated site preparations for the Nansemond SWIFT construction and completed geophysical bore holes for the 11 MAR wells. Ms. Zurvansky also reviewed the progress made in constructing the JR SWIFT facility, discussing various steps from demolition phases to where things stand today. Wastewater treatment plant and SWIFT treatment plant construction are ongoing at JR. The 10 MAR wells and well buildings at JR are also under various phases of construction. Substantial completion of JR SWIFT is now expected in October 2026.

There were no public comments.

The meeting adjourned at 1:42 p.m.

The Potomac Aquifer Recharge Oversight Committee
Meeting Minutes
September 18, 2025

Approved: Date:

12/12/25

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