The Potomac River Basin Drinking Water Source Protection Partnership

Quarterly Meeting Summary held via webinar on February 3, 2021

Attendees

Water Suppliers

Berkeley County PSWD:
Steve DeRidder

City of Rockville:
James Boone
James Woods

DC Water:
Salil Kharkar
Saul Kinter
Maureen Schmelling

Fairfax Water:
Nicki Bellezza
Steve Edgemon
Jamie Hedges
Susan Miller
Scott Powers
Gregory Prelewicz
Niffy Saji
Joel Thompson

Frederick County DUSWM:
Terri Snyder-Kolovich

Loudoun Water:
Thomas Barrack
Catherine Cogswell
Jessica Edwards-Brandt
Pam Kenel
Mark Peterson

Town of Leesburg:
Russell Chambers

Washington Aqueduct:
Anne Spiesman

WSSC Water:
Joel Caudill
Martin Chandler
Robin Forte
Nicole Horvath
Julie Karceski
Priscilla To

State and Local Agencies

DOEE:
Joshua Rodriguez

Frederick County:
Jennifer Thomas

MDE:
John Anthony
Greg Busch
Jonathan Leiman
Robert Peoples
Rebecca Warns

PA DEP:
Rhonda Manning

VA DEQ:
Sara Jordan

VDH:
Raven Jarvis

WV DHHR:
Brian Car
Monica Whyte

Federal and Regional Agencies

EPA Region 3:
Heather Arvanaghi
Virginia Vassalotti

ICPRB:
Renee Bourassa
Curtis Dalpra
Christina Davis
Rikke Jepsen
Heidi Moltz
Michael Nardolilli
Erfaneh Sharifi

MWCOG:
Steve Bieber

USGS:
Mary Kay Foley

Others

Virginia Tech:
Marc Edwards
Stanley Grant
Kristin Rowles

Business Meeting

Due to government-mandated social distancing requirements resulting from the coronavirus pandemic, the February 3, 2021 Quarterly Meeting was held via webinar. There were 54 attendees, including the moderator and presenters.

A recording of the webinar is available on the ICPRB YouTube page.

Presentations

Virginia Tech's Initiative to Reverse Freshwater Salinization (VT-REFRESH)
Dr. Stanley Grant & Dr. Marc Edwards, Virginia Tech (presentation)

Dr. Grant provided the vision for the VT-REFRESH initiative by the Occoquan Watershed Monitoring Laboratory (OWML) and the Virginia Tech Department of Civil and Environmental Engineering. The project is focused on local freshwater salinization with the goal of producing results applicable at the national scale. This work is currently funded by an NSF Growing Convergence Research (GCR) grant for up to $3.6M over five years. The team includes social scientists, microbiologists, hydrologists, geochemists, and engineers.

Rising salinity in the Occoquan Reservoir implies that its salt budget is out of balance. The proposed solution to this problem is based on Elinor Ostrom's idea that local stakeholders can manage their own resources. Thus, the project goal is to apply Ostrom's guidelines to foster collaborative learning and discovery, leading to stakeholder-driven bottom-up management of the salt budget for the Occoquan Reservoir versus top-down regulatory control. Phase 1 involves quantifying the contribution of the Upper Occoquan Service Authority (UOSA) to the Occoquan Reservoir Salt Budget. If Phase 1 is successful, Phase 2 funding will focus on contributions of the Bull Run and Occoquan River watersheds to the salt budget.

Dr. Grant presented findings from a manuscript that was recently accepted to *Nature Sustainability*, "Addressing the Contribution of Indirect Potable Reuse to Inland Freshwater Salinization." The paper compares sodium contributions to the Occoquan Reservoir by UOSA, Bull Run, and the Occoquan River. The Occoquan River has a relatively undeveloped watershed, and its sodium contribution tends to be the lowest. The Bull Run watershed is more developed. UOSA has the potential to deliver very high concentrations of sodium, but not necessarily high loads of sodium. In wet-weather conditions, sodium loads (mass/time) by source decrease in the order of Bull Run > Occoquan River > UOSA. In dry-weather conditions, the greatest sodium load is attributable to UOSA, followed by Bull Run, which is slightly greater than the Occooquan River load. One benefit of UOSA is that it contributes flow to protect the Occoquan Reservoir from drought, so it is not surprising that high sodium concentrations paired with high flow during dry weather means that UOSA contributes a high load.

UOSA is a funnel through which a myriad of sources flow. Raw water for drinking is withdrawn from Lake Manassas and Potomac River, and sodium is added in treatment. There are deicers

and other sodium sources used in the watersheds, and UOSA must add sodium in treatment processes. The Occoquan Reservoir receives sodium from not only UOSA but also from the watersheds. Reservoir water then goes to Griffith Water Treatment Plant where additional sodium is added. According to Dr. Grant, the major sodium contributors are: 14.7% wastewater treatment, 14.1% human excretion, 13.8% microfabrication facility, 3.9% water treatment, and 53.5% other sources. Much of the unknown fraction is likely household contributions to the sewershed, but some is contributed from water itself (e.g., deicers).

Ultimately, this work seeks to improve "salt productivity" (i.e., goods and services produced per unit salt discharged to the environment). Researchers hope to try solutions out in a controlled process to evaluate what works. Example interventions include reducing watershed sources of sodium in the water supply (e.g., deicers); more stringent pre-treatment requirements on industrial and commercial dischargers; switch to low-sodium water and wastewater treatment methods at UOSA and Fairfax Water; and encouraging households to adopt low-sodium products and practices (e.g., through social marketing).

Dr. Edwards presented "Impact of High Chloride on Galvanic Corrosion in Home Plumbing." He cited multiple examples of high-chloride waters associated with customer complaints for color and infrastructure degradation, including the catastrophic lead crisis in Flint, Michigan. Chloride is an aggressive ion that exacerbates corrosion. Chloride levels are generally rising, and in some areas, sulfate levels are decreasing and alkalinity is changing. Chloride-to-sulfate mass ratio (CSMR) > 0.58 can trigger catastrophic galvanic corrosion of lead solder. The critical CSMR is not yet known for other metals. Research by Stefan et al. (2008) indicates that every $1 of road salt applied leads to ~$46 in infrastructure damage, not including damage to public/private plumbing.

Dr. Edwards explained galvanic corrosion as corrosion of two dissimilar metals, i.e., a cathode and sacrificial anode. Galvanic couples are present in many residences include copper piping with lead solder and iron water heaters with aluminum or magnesium anodes. In experiments, Dr. Edwards found that loss of magnesium mass from an anode was significantly greater when exposed to chloride. As the anode wears down, hot water tanks can corrode and rupture. Additionally, corrosion can be associated with hydrogen gas production, hydrogen sulfide odor, and potentially-fatal *Legionella*. Zinc corrosion inhibitors can mitigate the effects of chloride in some cases.

Following the presentation on chloride and corrosion, Dr. Grant summarized the next steps for the NSF GCR research and the bid for an NSF Engineering Research Center (ERC) focused on salinization.

Workgroup Updates

Agricultural Issues
Pam Kenel, Loudoun Water

The 2018 Farm Bill provides potential opportunities for dedicated funding for source water protection. The Workgroup has been working to:

- develop relationships with State Conservationists and State Technical Committees (STCs),
- understand the NRCS process for how each state implements the Farm Bill directive to prioritize source water, and
- initiate dialogue with the states.

As a result of these relationships, the Maryland NRCS reached out to DWSPP when they decided to seek NWQI grant funding for the Little Pipe Creek watersheds. The implementation phase application was denied, but the three Frederick County HUC12s were accepted for a planning phase grant and watershed assessment. ICPRB will conduct this assessment in 2021-2022, with the goal of completing the assessment in time to submit for the July 2022 implementation phase funding. This watershed is a tributary to the Monocacy River in both Carroll and Frederick County, but there are less data available in the Frederick County portion.

The Agricultural Issues Workgroup is also working with EPA to speak with Virginia NRCS about priority watersheds in the upstream Potomac or Shenandoah watersheds. Implementation funding will involve bringing money to producers by leveraging funding pathways and the technical resources of DWSPP. The Workgroup is also discussing how to use the land prioritization tool.

Contaminants of Emerging Concern (CEC)
Martin Chandler, WSSC Water

M. Chandler provided an update the following areas of focus for 2021:

- PFAS
    - The UCMR5 monitoring was recently announced. The monitoring planned for 2023 will include 29 PFAS analyzed with a more sensitive EPA method. In addition to PFAS, UCMR5 will include lithium. The CEC Workgroup will continue tracking developments.
    - EPA has announced that it is planning to regulate PFOS and PFOA under the SDWA. Following UCMR3 detects for these substances, EPA issued a health advisory. An MCL is expected in the future.
    - The workgroup plans to investigate state and regional monitoring plans for PFAS. Instead of focusing on finished drinking water, the state monitoring program may focus on PFAS occurrence in groundwater and raw surface water.

- UMCR4 Data
    - Most sampling has finished, and data are coming through EPA's national database. The January 2021 upload was recently entered, and the Workgroup will put together a summary for DWSPP. Manganese was detected often in raw water. In the distribution systems, HAAs were also detected frequently.
- HABs and Cyanotoxins
    - In the summer months, there have been occasional reports of algal blooms and some algal toxins in the Potomac.
    - Focus this year may shift from the mainstem Potomac River to the reservoirs (i.e., Patuxent and Occoquan).
- Endocrine Disrupting Compounds (EDCs)
    - The Workgroup would like to follow-up on the DC Water-led Potomac River EDC study.
- Microplastics (MPs)
    - There are many publications on MP occurrence in oceans and in the Chesapeake Bay. The Workgroup is unaware of many studies in freshwater systems or reservoirs.
    - Workgroup may investigate whether there is a useful crossover to the Potomac for an MP study.

Early Warning & Emergency Response (EWER)
Joel Thompson, Fairfax Water

The EWER Workgroup has been working to update spreadsheet on utilities' monitoring parameters, especially emphasizing online parameters. Group is considering how to alarm monitoring to detect spills, but security issues may exist. Many of these parameters may trigger nuisance alarm when it rains. Fairfax Water has looked at using toxicity monitors which do not appear to generate nuisance alarms.

MWCOG has received a UASI grant to install two multi-parameter sondes at USGS stations at Point of Rocks and one on the Monocacy River. FEMA has granted clearance for the Point of Rocks location. In order to provide early warning, a method to alarm the sites needs to be developed.

The Workgroup also discussed booming since White's Ferry is no longer in operation. The workgroup may be contacting some other organizations about additional methods. S. Bieber provided an example geographical response plan to be developed once a method of booming is identified.

The EWER Workgroup is working with the Water Quality Workgroup to plan an exercise to practice using the spill listserv. J. Thompson also mentioned the possible creation of sub-groups focused on either the Patuxent Reservoir or the Occoquan Reservoir.

Reaching Out
Lisa Ragain, MWCOG

C. Davis provided an update on behalf of the Reaching Out Workgroup. The Workgroup is currently focused on developing the 2020 DWSPP Annual Report. The Workgroup also discussed a possible campaign to promote the DWSPP Land Prioritization Project to stakeholders and end users.

Urban and Industrial Issues
Greg Prelewicz, Fairfax Water

The Workgroup recently met to discuss two NPDES permit renewals. The first is the WV Alliant Techsystems/Allegany Ballistics Lab, which is located along the North Branch upstream of Cumberland, MD. The second that is open for public comment is the VA Pactive Plastics facility located along a tributary of the Shenandoah River. The Workgroup discussed issues and talking points for comments related to these permits, including:

- Alliant
    - Located near Keyser, WV
    - Facility dates to the 1940s and consists of several "plants" within the facility
    - Facility conducts research, development, and production of solid fuel propellant rocket motors, gas generators, and explosive warheads for DoD. In addition, fiber composite structures and machined metal parts are fabricated at the facility.
    - EPA R3 high-priority RCRA corrective action site for groundwater:
        - Trichloroethene (TCE)
        - Vinyl chloride
        - Perchlorate
    - Outfalls that discharge to the North Branch Potomac River include stormwater, treatment, and disposal systems for treated industrial wastewater, sanitary wastewater, and untreated other wastewater.
    - This permit renewal includes a new sewage treatment plant and a new treatment and disposal system to discharge untreated stormwater and other wastewater (water softener and boiler blowdown).
    - After 24 months, the permit modifies perchlorate discharge limits to reflect the treatment improvements.
    - Regarding the perchlorate issue, the discharge limits are being decreased, but some of the maximum levels are still considerably higher than measured Potomac River background concentrations and raw water concentrations measured at various intakes in the 2008-2009 timeframe. G. Prelewicz noted that possible perchlorate regulation will be reviewed by the Biden EPA.
    - Regarding PFAS, a possible comment is to request PFAS sampling of the discharge.
    - The Workgroup confirmed with MDE that they do coordinate with WV on water quality standards. This section of the North Branch is designated as Class P for Maryland public water supply.

- Pactiv
    - Located along the South River, upstream of Harrisonburg, VA
    - Facility dates from 1950s.
    - Facility manufactures plastic films from synthetic polymer resins at this facility. The discharge consists of treated sanitary and process wastewaters, noncontact cooling water, and other non-process wastewaters and stormwaters associated with industrial activity.
    - Workgroup discussion focused on PFAS. Standard industrial classifications (SIC) indicate this facility may be a PFAS source. Fairfax Water's letter also requests that this facility conduct sampling for PFAS during this permit cycle.
- P. Kenel commented on the value of using the SIC codes to identify possible issues and asked whether there are other contaminants that DWSPP should target in comments. G. Prelewicz agreed that there may be some. Due to the nature of these two facilities, PFAS were clear issues.

Fairfax Water has recently submitted a comment letter supporting a $175,000 budget amendment in VA to support Virginia Tech's Transportation Institute and Horticulture Department for field testing a method of recovering salt.

The next meeting of the MWCOG WaterSuite Users Group is planned for February 25, 2021.

Water Quality (WQ)
Niffy Saji, Fairfax Water

The Water Quality Workgroup met in January. At the meeting, E. Sharifi from ICPRB requested feedback on the Water Quality Data Inventory. Workgroup members thought sodium and PFAS were of interest and should be included. The following programs were also recommended for inclusion: MWCOG salinization project, MDE PFAS monitoring, and the EPA Water Resources Registry.

Separately, the WQ Workgroup has been working to map monitoring sites for salt (i.e., salt, chloride, or surrogates) in the Potomac watershed. The Workgroup is also working to update the existing map on HAB monitoring and looking into SAV monitoring in the Potomac River.

The DWSPP Spill Response Plan has been moved to the Spills listserv portal. The Workgroup will work on updating the plan, including Appendix F. In coordination with the EWER Workgroup, the Water Quality Workgroup plans to hold a Spills listserv exercise.

Ad Hoc Land Prioritization Implementation
Michael Nardolilli, ICPRB

M. Nardolilli thanked DWSPP and the water suppliers that funded the land prioritization project. At the Commission's Business Meeting in March, ICPRB staff will request that ICPRB adopt a voluntary Land Conservation Policy based upon the Land Prioritization Project conducted by ICPRB staff and funded through DWSPP. The study was designed to assist land trusts and other

funders in targeting their efforts to protect parcels identified in the study as important to drinking water supplies in the Potomac Basin. Both the Executive Committee and the Commission have received detailed briefings about the project. In discussions with land trusts and other funders, we learned that the imprimatur of a government agency such as ICPRB would be critical to securing the voluntary conservation of these lands by making tax benefits available to landowners who chose to place voluntary conservation easements on their land or to sell their properties to government agencies.

The proposed policy states:

The Interstate Commission on the Potomac Basin hereby adopts the Land Prioritization Project of the Drinking Water Source Protection Partnership as a Land Conservation Policy and urges the voluntary conservation of those parcels that have been identified as important for the preservation of drinking water supplies in the Potomac River Basin.

A. Spiesman asked whether the policy would encompass amendments or updates to the project. M. Nardolilli confirmed that it would since DWSPP is identified as the source of the project. A. Spiesman made a motion that DWSPP recommend adoption of the project as a voluntary policy by ICPRB. C. Davis asked if there were are any comments or objections. None were voiced, and M. Nardolilli confirmed that he would report at the March 2, 2021 Business Meeting that DWSPP recommended adoption of the voluntary policy. C. Davis and M. Nardolilli indicated that the Ad Hoc Land Prioritization Implementation Workgroup would be begin meeting to plan how to engage the governmental and land trust stakeholders.

Administration Updates
Christy Davis, ICPRB

C. Davis confirmed that membership invoices were sent in December.

Regarding the Ad Hoc Spill Notification Workgroup, C. Davis indicated that about 50% of the Spills listserv members responded to the survey. Efforts to confirm the membership of those who did not respond are ongoing. The member visibility setting was also changed to allow members see names and contact information for other members.

C. Davis detailed meetings with VA DEQ Northern Virginia and Valley Regional Offices and the Office of Pollution Response and Emergency Preparedness to improve spill response communications and plans.