Salt Management Strategy (SaMS)
2nd Water Quality Monitoring and Research Workgroup Meeting

February 14, 2019

The second meeting of the Water Quality Monitoring and Research (WQMR) Workgroup for the Salt Management Strategy (SaMS) was held from 9:30 am – 12:00 pm on February 14, 2019 at AlexRenew, 1800 Limerick Street, Alexandria, Virginia.

Attendance

Sixteen (16) individuals, including two Virginia Department of Environmental Quality (DEQ) staff members and one staff member from the Interstate Commission on the Potomac River Basin (ICPRB; DEQ's contractual support), participated in the meeting. Six of the participants joined the meeting via teleconference.

Emily Bialowas, Izaak Walton League
Joni Calmbacher, City of Alexandria
Scott Crafton, Virginia Department of Transportation (VDOT)†
Dennis Cumbie, Loudoun County†
Shannon Curtis, Fairfax County
Dave Evans, DEQ*
Will Isenberg, DEQ*
Neely Law, Center for Watershed Protection†
Joel Moore, Towson University†
John Muse, Virginia Department of Transportation (VDOT)†
Ivy Ozmon, City of Manassas
Niffy Saji, Fairfax Water
Erfaneh Sharifi, ICPRB*
Russ Short, Northern Virginia Trout Unlimited (NVTU)†
Jonathan Witt, Fairfax County
Carol Wong, Center for Watershed Protection.

*Facilitator
†Participated via teleconference

Meeting Highlights

At this meeting, the workgroup members reviewed the previous meeting highlights; discussed the monitoring inventory survey, fate and transport conceptual model, and explored new ideas for potential recommendations. The main take-aways from this meeting are:

- Workgroup members agreed that the draft conceptual model will be a tool for asking questions, but should not be the focus of monitoring efforts
- Workgroup members identified other organizations to encourage to participate in the water quality monitoring data survey, and to use the survey results as a "grab-and-go" resource with organization names and contact information.
- Workgroup members identified a number of ways to look at water quality and how it may respond to Best Management Practice (BMP) implementation. These included changes in long-term trends, the magnitude of storm-specific spikes in specific conductance, background summer concentrations, and shallow groundwater concentrations.

- Several potential funding opportunities were discussed (e.g. academic institutions, organizations, and government agencies).
- DEQ sought nominations for 1-2 volunteers to 1) present the SaMS WQMR Workgroup status at the next Stakeholder Advisory Committee (SAC) meeting and 2) represent this workgroup on the Steering Committee.

Notes for Other Workgroups / Potential Areas of Overlap:

- WQMR Workgroup members suggest that the Salt Tracking & Reporting Workgroup members recommend gathering the following information: How much salt is used, the size of the area it is applied to, the location where the salt was applied, and which BMPs (if any) were implemented.

Follow-up Action Items

1. Submit ideas on a monitoring pilot project to measure the impact of BMPs on water quality.
    a. Volunteer: workgroup members agreed to all provide their ideas.
2. Identify geographic gaps in chloride-conductivity relationships for the different physiographic provinces in the SaMS project area.
    a. Volunteer: DEQ
3. Identify general criteria for a monitoring program that could be implemented by any organization to better understand the impact of BMPs on salt concentrations. DEQ will frame the input needs in a written form and will send it to the WQMR Workgroup members.
    a. Volunteers: Shannon Curtis and Niffy Saji
4. Explore the existing data and identify resources and partners to support a "grab-and-go" resource for organizations looking to implement the water quality monitoring recommendations of the SaMS.
    a. Volunteer: DEQ
5. Coordinate information needs with the Salt Tracking & Reporting workgroup
    a. Volunteer: DEQ
6. Update the draft Conceptual Model of Salt Origin, Transport, and Fate with workgroup member feedback.
    a. Volunteer: Joel Moore, Russ Short, and DEQ
7. Review long-term trends in Specific Conductance throughout the region
    a. Volunteer: DEQ

Meeting Summary

Introductions

The meeting opened with brief introductory remarks from DEQ. Participants then briefly introduced themselves, providing their name and the organization they represent.

The objectives for this meeting were to discuss ideas for the final workgroup recommendations, identify the information needed to finalize recommendations, and discuss action items so that the workgroup can continue to move forward on each action.

DEQ announced two administrative items:

- The 3rd SAC meeting is being scheduled for late May/early June 2019.
- In the 2nd SAC meeting, it was decided to convene a steering committee to help draft the final strategy.

The summary for the previous WQMR Workgroup meeting is available online. Highlights of the first meeting included:

- Workgroup members identified three areas of monitoring recommendations, including:
  - Find ways of measuring the impact of Best Management Practices (BMP) implementation on water quality,
  - Look at the origin, transport, and fate of salt, and find a good model to inform the workgroup discussions and actions, and
  - Look at reporting standards for data comparability.
- High priority topics for this workgroup were existing water quality data, pilot programs, and parameters of interest for WQMR Workgroup.
- The WQMR recommendations should address different audiences, including government agencies, private monitoring groups, and volunteer organizations.
- Understand existing monitoring initiatives throughout the region to assist stakeholders and the WQMR Workgroup initiatives.

Action Item Presentations

Volunteers presented on two action items.

Action Item: Develop draft conceptual model for salt fate and transport (Russ Short)

The draft Conceptual Model of Salt Origin, Transport, and Fate was discussed. Mr. Short compiled information from 8 different resources (a list of references used to develop a draft conceptual model can be found here), and walked through the elements of the draft conceptual model.

Workgroup members discussed the draft and provided their feedback.

A comment was made that the model focused on sodium chloride. Are there other ions that are important/different? The workgroup may need to consider some other chlorides (e.g. magnesium chloride, and calcium chloride). Chloride would move similarly, but the cations may behave differently as they move through the system.

Some other feedback:

- Chloride toxicity decreases in the presence of calcium and magnesium. It may be helpful, therefore, to keep track of calcium and magnesium inputs to urban streams.
- For groundwater, the chloride residence time is years to decades, not because of the chemical interaction but just because it takes water a long time to move through the subsurface and then to the streams. For surface water, the effects from salt application are short-term.
- Local baseflows are supported by shallow groundwater flow. In a 20-year data set, there is an increase in specific conductance from baseflow in non-winter months in Fairfax County. USGS in Reston may have insights on localized groundwater conditions from their well monitoring programs.
- It is difficult to measure the impacts of BMPs on groundwater.
- In order to develop informed recommendations, the environmental effects of chloride fate and transport should be more clearly explained.
- Centralized stormflow management concentrates pollutants in shallow groundwater from retention/detention BMPs.
- The conceptual model may inform monitoring recommendations.

- It is important to gauge the level of detail needed to inform the monitoring recommendations. For example, some of the sources may be more important than other sources (e.g. natural sources).
- Soil geology is very important when considering site specific issues.
- Human health impacts (e.g. toxin releases) and weathering sources could be added to the framework.
- Chemical interactions in reservoir sediments are a concern of the workgroup.
- The model can be refined as monitoring work and discussions proceed.

The workgroup agreed that after some modifications based on suggested edits, the conceptual model can be added to as we learn more, but should not be a workgroup priority item from here forward.

Action Item Develop a survey for ion related monitoring efforts and coordinate edits with WQMR Workgroup (DEQ)

DEQ staff developed a survey using Izaak Walton League's survey as a template for ion related monitoring efforts and shared it with 16 organizations directly and 4 distribution networks. They received responses from 12 organizations. Of those 12 organizations, only 9 collected ions data.

DEQ presented the summary of results from the Ion Monitoring Survey and shared the Survey Distribution Tracking Sheet with the WQMR workgroup members.

Workgroup members discussed the survey and suggested a follow-up with the following organizations:

- Loudoun Water
- Prince William County by checking with their representative in SAC meetings
- The City of Manassas for Lake Manassas monitoring data
- USGS for shallow and groundwater monitoring data
- Other local governments

A member suggested to closely review ICPRB's water quality data inventory which was initiated a couple of years ago. The water quality data inventory may give information about monitoring organizations and their contact information. This information could be used to follow-up on the monitoring efforts.
Workgroup members agreed that it is important to know who is currently monitoring for ion data.

Members identified the next steps as follows:

- Reach out directly to more organizations (listed above) and prioritize their response to the first few questions of the survey.
- Assemble the information from the survey to serve as a "grab-and-go" resource for partners to use when monitoring in the region.
- The information should be organized into who is monitoring ions, what are the ions being monitored, and contact information for the monitoring groups. Other information collected can be summarized and accompany the inventory.

Recommendations Scoping

Workgroup members discussed the monitoring recommendations:

- It is important to link salt use data with water quality monitoring data. Therefore, useful information for the Salt Tracking & Reporting workgroup to consider recommending includes:
    - How much salt was used.
    - The size of the area where salt was applied.
    - The location of the area where salt was applied.
    - Whether or not BMPs were implemented and if so what they were.
    - Monitoring could begin with seasonal reporting by location and jurisdiction. Ultimately reporting for each storm event is needed to support analysis of water quality response to BMPs.
    - Private sector salt use is very important to pursue, starting with the biggest local service providers.
- A consistent approach to measure ions is needed.
- Designating tiers of data related to the level of quality assurance that are appropriate for different uses may help to develop the monitoring recommendations.
- Developing specific conductance and chloride relationships can help to develop an area-specific regression model to allow for chloride concentration estimates. Fairfax County has a conductivity monitoring program in all of the County's three physiographic provinces.
- It is critical to link salt tracking and monitoring to specific locations in order to gauge water quality responses to BMP implementation.
- Fairfax County has the experience to deploy short term monitoring stations. DEQ trend stations (n=13) are also distributed across Northern Virginia. It is recommended that DEQ add some continuous monitoring probes to their stations.
- A workgroup member mentioned that a regional specific conductance to chloride model is being developed for the Mid-Atlantic.
- It's worth studying what other jurisdictions (e.g. Minnesota) have done to document the impact of BMPs on water quality.
- Defining a non-prescriptive water quality monitoring program for salt is a critical component of this workgroup.
- There was interest in exploring long-term trends in specific conductance. As a part of this analysis, identifying long-term patterns in peak conductance measurements (including how they relate to precipitation) is important.
- Workgroup members identified the importance of scale when it came to making monitoring recommendations. Smaller scales allow for fewer variables.

Workgroup members continued the discussion by concentrating on a pilot monitoring program. A workgroup member suggested defining a pilot monitoring program in areas where the USGS continuous monitoring probes are available. Workgroup members agreed that the recommendations should encourage pilot projects. Since it will likely take years to show water quality improvements due to groundwater influences, and because of the numerous variables affecting salt concentrations in surface waters, proposing a pilot project approach as a SaMS recommendation seems more realistic.

Workgroup members identified that pilot projects should consider:

- Funding to support implementation. The Chesapeake Trust Request for Proposal was identified as one option to consider for next year.
- Partnerships with academia.
- A phased approach with reporting milestones.
- A multi-jurisdictional approach.

Workgroup members agreed to each share their thoughts for a pilot project aimed at measuring the impact of BMPs on water quality. To encourage all workgroup members to contribute, the workgroup agreed that these ideas could be very simple or very detailed. DEQ will follow up with workgroup members on the general criteria for the pilot project.

Meeting Wrap-up and Next Steps

It was recommended that the workgroup should focus on the following items through summer 2019:

1. Articulate a written format of the pilot program and identify a pilot project
2. Identify geographic holes in specific conductance records (i.e., are all physiographic provinces represented).
3. Identify the criteria for a general monitoring program
4. Identify the existing ion monitoring programs and their contact information as a "grab-and-go" resource bag
5. Define what the WQMR Workgroup needs from the Salt Tracking and Reporting Workgroup
6. Revise the draft fate & transport conceptual model
7. Look at the long-term water quality trends for specific conductance throughout the region.

DEQ suggested workgroup members submit their ideas on what monitoring pilot project recommendation this workgroup should offer. Workgroup members agreed to work on the monitoring pilot project objective. DEQ offered to define some criteria for the monitoring pilot project objective, which the workgroup discussed should include watershed characteristics, objectives, and suggestions for how to use the known existing monitoring programs. DEQ will set a date to return the monitoring pilot project proposals and to review the inputs before the next WQMR Workgroup meeting.

DEQ requested at least one volunteer to present on the status of WQMR Workgroup at the 3rd Stakeholder Advisory Committee meeting. DEQ will draft a template presentation for this purpose and will send it to the volunteer(s).

DEQ asked for 1-2 volunteers from WQMR Workgroup to be a part of the steering committee. This committee will draft the strategy based on the inputs from workgroup meetings.

DEQ will send out a follow-up survey after this workgroup meeting to add ideas to the meeting directions. Volunteers can provide nominations for themselves or other people that should be in the steering committee using the survey. Volunteers to present in the 3rd Stakeholder Advisory Committee meeting also can use this survey to volunteer.

Handouts from the meeting are available on the SaMS Meeting Materials website.

All information, questions, additional resources, etc. should be emailed to Will Isenberg (william.isenberg@deq.virginia.gov) and Dave Evans (david.evans@deq.virginia.gov) (to reduce email traffic among WQMR members.

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Meeting notes were prepared and submitted by the Interstate Commission on the Potomac River Basin.

Additional Feedback Contributed to the Follow Up Survey:

A survey was shared with workgroup members following the meeting to capture any additional thoughts members may have had following the meeting. Feedback is arranged below based on the sections of the agenda. Only sections where additional thoughts were provided are included:

Recommendations Scoping

"Regarding the idea of a Pilot monitoring project or effort, it might be useful to compare commercial/institutional site(s) with roadway sites to get a better understanding of the differences in scales of chemical applications and associated runoff -- also, ideally, have a "reference" site monitored that would have little or no chemicals in the runoff"