

Susquehanna River Basin Commission (SRBC)
Water Quality Advisory Committee (WQAC) Meeting Minutes
SRBC Office
4423 N. Front Street, Harrisburg, PA

December 10, 2014
10:00 a.m. – 3:00 p.m.

A. Welcome and Introduction

Andrew Gavin, SRBC, opened the meeting with introductions (see Participant List in Attachment A). The WQAC usually meets twice each year, in spring and fall.

B. Monitoring Coordination

Jamie Shallenberger, SRBC, gave an overview of SRBC's monitoring projects. SRBC is monitoring for the Chesapeake Bay and other U.S. Environmental Protection Agency (USEPA) projects throughout the basin. SRBC is providing ongoing support for Total Maximum Daily Loads (TMDLs) in the Lower Susquehanna region, and providing assistance to the National Stream and River Assessment (NRSA) program in the Susquehanna and Ohio basins. The Monitoring and Protection program at SRBC also monitors gas drilling impacts in Pennsylvania state forests and operates 58 real-time stations for the Remote Water Quality Monitoring Network (RWQMN). Other efforts include abandoned mine draining (AMD) sampling and recovery monitoring, Flow Monitoring Network (FMN) research, Aquatic Resource Surveys (ARS), aquatic invasive species research on *Didymo geminata*, urban stormwater Best Management Practices (BMPs) in Cedar Run/Paxton Creek, and source water protection/Early Warning System.

SRBC recently developed a blended probabilistic sampling design with long-term fixed monitoring sites for more statistically robust data and cost savings in the Upper and Middle Susquehanna subbasins. The agency also adopted standard baseline monitoring parameters for all station visits, including instantaneous discharge, dominant ion chemistry, suspended sediment, and direct readings of pH, temperature, dissolved oxygen, specific conductance, and turbidity. SRBC expanded fish sampling to fill data gaps in the basin, support NRSA, and share information on deformities, erosion, lesions, and tumors (DELTs), community assemblage, and water quality sets. The agency compared macroinvertebrate sampling and IBI protocols with N.Y. State Department of Environmental Conservation (NYSDEC) by performing side-by-side surveys with NYSDEC. SRBC also evaluated Pa. Department of Environmental Protection (PADEP) IBI and Chessie IBI.

Current SRBC-funded milestones include the following: completing the fifth year of FMN research project, surpassing three consecutive years of continuous in-stream monitoring at majority of 58 RWQMN stations, conducting ARS research, sampling for *Didymo* in Pine Creek Watershed (which was discovered in 2013 and has not expanded), and initiating an urban stormwater BMP demonstration project in Hampden Township, Cumberland County, Pa. The

study intent of the RWQMN is to develop baseline data, focus on water supply/water quality concerns at mid-scale settings, and inform future monitoring. Flow, water quality, water chemistry, and biology are measured at the 58 stations. The web site interface of the RWQMN can be found at <http://mdw.srbc.net/remotewaterquality/>.

Future directions include more integration of CIM data, instantaneous flow, climate patterns, and land use activities through a NFWF grant project. SRBC also intends to review and re-visit project goals, approaches, and findings of the RWQMN, FMN, and ARS. The agency will adopt formal fish identification protocol including rigorous quality assurance checks and training as needed. SRBC will continue to coordinate and share data with other agencies, and will explore sediment and turbidity relationships, a Water Quality Index, and biostressors.

C. What are the current coordination venues members utilize?

Sherm Garrison, Md. Department of Natural Resources (MDNR), gave an update on Maryland's approach to a statewide and collaborative Maryland Water Monitoring Council (MWMC). The MWMC began in 1994 and was modeled after the federal Intergovernmental Task Force on Monitoring. The MWMC is aligned under MDNR and includes an Executive Secretary that supports key activities such as board meetings and activities, workshops, and web site updates and serves as a communications hub. The goals of the MWMC include the following: forum for effective communication, cooperation, and collaboration; facilitate collaborative watershed-based monitoring strategies; document monitoring activities in Maryland; and promote quality-assured procedures for collection, analysis, assessment, and data management. The Board of Directors includes members from state, local, and federal agencies, colleges/universities, consultants/industry, volunteer monitoring/environmental groups, and regional/intergovernmental organizations.

The MWMC has several committees, including monitoring and assessment, community outreach and citizen stewardship, information management and communication, groundwater, nominating, awards, and planning. The MWMC has held several types of workshops ranging from a stream monitoring roundtable, stream-gaging strategy, climate change, vernal pools, benthic macroinvertebrate taxonomy, electronic tools, stream symposiums, sampling protocols and methods comparability, illicit discharge detection and elimination, road salt and water quality, and wildlife impacts on water quality.

The MWMC holds an annual meeting in late fall. It is a themed one-day conference with keynote and plenary talks. The first annual meeting in 1995 had 150 attendees, and the most recent meeting in 2014 had 440 attendees. The meeting has spaces for poster presentations and a program with abstracts, with electronic distribution starting in 2013. There are long breaks for networking as well. Registration for this meeting in 2014 cost \$55 (early bird fee) to \$70, with non-profit members paying \$30 and students \$25. Poster presentation was free with paid registration. Commercial vendors were charged \$275 for table space, but spaces for agencies and non-profit organizations were free with paid registration. Net income from this event helps support workshops, board retreats, and awards throughout the following year.

The MWMC succeeds because of the inclusiveness of membership, asking membership for ideas, finding committee and workshop champions, repeating successes and changing failures, learning from the national WQMC and other states, and reaching out to planners, social scientists and others. More information on the MWMC can be found at <http://mddnr.chesapeakebay.net/MWMC/MWMC2010/index.asp> or by contacting Dan Boward, Executive Secretary, at dan.boward@maryland.gov or (410) 260-8605.

Sue Brantley, Penn State University, mentioned the free HydroDesktop software from the CUAHSI Hydrologic Information System, which can find and pull in other people's data. It can be used with USEPA's STORET, SRBC data, and USGS data. More information can be found at www.shalenet.org. She also mentioned that the shale network has an upcoming conference in May 2015 (see www.shalenet.org/2015 for more information).

D. Lunch

E. SRBC's Remote Water Quality Monitoring Network Update

Jamie Shallenberger, SRBC, gave a brief update on the RWQMN. Currently, there are 58 stations operating in real-time throughout the Marcellus shale region. SRBC monitors flow, water quality, aqueous chemistry, and biology at these stations. As of 2013, 35 stations had at least three years of continuous instream monitoring. Fifty of the stations had been sampled for three years for macroinvertebrate assemblage using the PADEP Freestone IBI scoring analysis. Just 5.8 percent of all samples scored as "impaired." SRBC found no correlation between gas well density and IBI score in any year or all years combined-regional annual weather patterns appear to drive community structure.

Operating the RWQMN is an expensive capital investment and an ongoing resource-intensive operation. The network uses AQUARIUS software and has its own dedicated server. Data must be corrected due to drift, fouling, and malfunction. There are over four million data records per year since the data are gathered in real-time communications. Future aims include investigating the relationship between sediment and turbidity and interpreting land use changes.

Other activities such as agriculture and stormwater can also impact the landscape. SRBC is also participating in a group study of dirt and gravel roads.

F. USGS Presentation on Groundwater Monitoring in the Marcellus Region

Jeff Chaplin and Dennis Risser from USGS gave a presentation on groundwater monitoring using domestic-supply wells in the Marcellus region. Objectives of this quality assessment were to characterize the current chemical quality of groundwater from shallow freshwater aquifers used by private domestic-supply wells and to fill a gap in our understanding of groundwater quality in rural areas relying on well water. Project partners included Lycoming County, Wayne Conservation District, PADEP, West Branch Regional Authority, and PA

Regional Health Systems. Major ions and metals, dissolved gasses, organic indicators, dissolved and suspended solids, bacteria, volatile organic chemicals, alcohols, total Kjeldahl nitrogen, gross alpha and beta, radium, and radon were analyzed through three different laboratories.

Site selection methodology included the following: establish a study area; divide study area and create site-selection points; obtain well record data; establish well selection criteria, identify potential wells for sampling; and contact homeowner to obtain sampling permission. To establish a study area, wildy unpopulated areas and public water supply service areas were removed from the site-selection process. Removals of these areas ensured that site-selection points were within proximity of domestic-supply wells. The study area in Lycoming County was divided and site-selection points were created (72 random points, with 72 randomly selected alternate points). Well selection criteria included wells having the following parameters: used for domestic supply, where a “raw” untreated sample could be collected, near a randomly generated point, having an associated drill record, drilled after 1970, and not dug or in a pit. Well record data were obtained from the PA Department of Conservation and Natural Resources (PADCNR), Bureau of Topographic and Geologic Survey-Groundwater Information System.

USGS worked with Lycoming County and Wayne County to monitor 70 and 90 wells, respectively. Data are stored in the USGS National Water Information System (NWIS) and available online at <http://waterdata.usgs.gov/pa/nwis>. Results were given to each well owner and a peer-reviewed USGS Open-File report will be published.

USGS has also been involved with water quality monitoring and research, including new long-term groundwater quality monitoring network, intermediate-depth groundwater monitoring in test holes, and methane sampling in streams. For the long-term network, 21 wells were monitored. These wells focused on the shale gas region, and were tested and dedicated sampling pumps were installed. The pumps were analyzed by PADEP. Samples were taken semi-annually. Analytes included field parameters such as pH, alkalinity, specific conductance, etc. Major analytes included calcium, magnesium, potassium, etc. Trace metals, nutrients, hydrocarbon gases, and volatiles were also measured.

For the intermediate-depth groundwater monitoring in test holes, the quality of water below a depth of 300 feet was measured. Samples were taken from core holes, not drilled wells, to characterize fresh and saline water. Saline from the test holes was indistinguishable from hydraulic fracturing flowback.

As for the methane sampling in streams, a study was done in Utah. An integrated sample of multiple groundwater paths was taken, and wells were not needed. The streams were easy to sample. For more information, see <http://ut.water.usgs.gov/projects/methanestream/>. USGS also gaged, sampled, and analyzed Sugar Run in Pennsylvania. Graduate students from Penn State University did isotopic data analysis and methane reconnaissance. Results can be found at <http://pubs.usgs.gov/of/2014/1126/>.

G. Monitoring Urban Watersheds at the “Micro/Macro” Scale

Tyler Shenk, SRBC, gave a presentation on monitoring urban watersheds. SRBC currently has two stormwater BMP monitoring demonstration sites at Hampden Township and on the SRBC property. SRBC is monitoring urban stormwater in Cedar Run and Paxton Creek. The site in Hampden Township has an aquifer recharge system that provides a controlled method for aquifer recharge. The constructed system provides detailed sampling opportunity, and the use of rain gardens and plantings improves water quality.

BMP monitoring parameters include temperature, pH, dissolved oxygen, conductivity, and turbidity in the field. Lab parameters include nutrients such as nitrate, nitrite, nitrogen, and phosphorus (dissolved and total), metals such as zinc, copper, and lead, total dissolved solids, total suspended sediment, total organic carbon, chloride, and oil and grease. SRBC is currently collecting “first flush” grab samples, and future sampling will include flow-weighted composite sampling over 5 events, ISCO samplers, and weather stations.

SRBC has monitored nine sites in Cedar Run since 2011. Spring and fall base flow is collected, as well as two-four high flow events. Macroinvertebrates are collected in the spring at nine sites, and fish are collected in the fall at four sites. Cedar Run has two continuous instream monitoring stations. Karst geology is a challenge in Cedar Run with gaining and losing reaches and sinkholes. SRBC investigates this through dye release studies.

SRBC has monitored the Paxton Creek Watershed in Harrisburg, Pa., since 2006. Spring and fall base flow is collected at four sites. Two to four high flow events are captured every year. Macroinvertebrates are collected in spring and fall, and PA IBI scores range from 10.1 to 44.4 (impaired).

H. Adjourned

The meeting was adjourned at approximately 3:00 p.m.

Attachment A

Participant List

Name	Organization
John Backus	MDE
Sue Brantley	Penn State
Ellyn Campbell	SRBC
Jeff Chaplin	USGS
Scott Cook	NYSDEC
Kim Dagen	SRBC
Andrew Dehoff	SRBC
Katy Dunlap	Trout Unlimited
Sherm Garrison	MDNR
Andrew Gavin	SRBC
Joe Graney	Binghamton University
Mark Hartle	PFBC
Michael Helfrich	Lower Susquehanna Riverkeeper
Hilary Hollier	SRBC
Hoss Liaghat	PADEP
Josh Lookenbill	PADEP
Jinnie Monismith	ALLARM
Bill Richardson	USEPA
Dennis Risser	USGS
Andrew Roach	USACE
Rob Ryder	PADCNR
Curtis Schreffler	USGS
Jamie Shallenberger	SRBC
Tyler Shenk	SRBC
Dustin Shull	PADEP
Luanne Steffy	SRBC
Jason Zhao	MDE