Delaware River Basin Commission
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Steven J. Tambini, P.E.
Executive Director

Minutes
Water Quality Advisory Committee
July 18, 2018

Members & Alternates:

NYS DEC
Sarah Rickard (remotely)
EPA
Kuo-Liang Lai
Brent Gaylord (remotely)
Wayne Jackson (remotely)
NJDEP
Biswarup Guha
Environmental
Maya van Rossum (Delaware Riverkeeper Network)
Regulated Community Industrial
Bart Ruiter (Chemours)
Kim Long (Exelon, remotely)
DNREC
Dave Wolanski (remotely)
PADEP
Tom Barron
Matthew Kundrat
Academia/Science
Not represented
Local Watershed Organizations
Not in attendance
Regulated Community Municipal
Jay Cruz (PWD)
National Park Service
Rich Evans (remotely)

Other Attendees:
Evelyn MacKnight (EPA)
John Yagecic (DRBC)
Namsoo Suk (DRBC)
Li Zheng (DRBC)
Elaine Panuccio (DRBC)
Ron MacGillivray (DRBC)
Jake Bransky (DRBC)
Victoria Trucksess (DRBC)
Gabriel Angeloni (DRBC)
Helen Pang (NJDEP)
Pam Bush (DRBC)
Ken Najjar (DRBC)
Ian Piro (DELCORA)
Jeff Fischer (USGS)
Kathrine Bentley (EPA)
Denise Hakowski (EPA)
Kathy Klein (WRADRB)
Meg McGuire (Delaware Currents)
Eric Vowinkel (Rutgers University)
Brenda Gotanda (Manko Gold Katcher & Fox, remotely)
Steve Seeberger (NJDEP)
Jean Malafronte (Greeley and Hansen)
Kelly Anderson (PWD, remotely)
Rhonda Manning (PADEP, remotely)
Verna Harris (consultant to WPF)
Andy Thuman (HDR)
Adam Hendricks (PWD)
Marco Alebus (NJDEP)
Erik Silldorff (Delaware Riverkeeper Network)

The meeting was called to order at approximately 9:35 AM by Bart Ruiter.

Meeting Minutes

Draft minutes from the March 29, 2018 had been previously provided to members for review. Maya van Rossum noted that current minutes included less detail than in the past. DRBC staff cited posting of presentations on the DRBC web site, lack of recordings and transcripts, and reductions in administrative support for changed levels of detail. DRBC staff indicated draft minutes are shared with advisory committee participants to allow capture of relevant discussions. Maya van Rossum inquired about being able to video record advisory committee meetings. Bart Ruiter expressed concern with video recording meetings. DRBC staff indicated that would need to confer internally regarding that request.

Jay Cruz moved that the March 29, 2018 minutes be approved and Kuo-Liang Lai seconded the motion. The minute were unanimously approved.

Approved minutes are posted on the DRBC web site at:
https://www.nj.gov/drbc/library/documents/WQAC/032918/minutes.pdf

Status Updates – Monitoring in support of eutrophication model development

Elaine Panuccio and Jake Bransky provided a verbal update on the status of multiple monitoring efforts in support of eutrophication model development. Following the discussion about minutes detail, Bart Ruiter requested that the minutes reflect a detailed bulleted list of the monitoring status updates (below):

Delaware at Trenton & Schuylkill River Nutrients

- Twice per month composite samples are collected from the Delaware at Trenton and Schuylkill Rivers at Calhoun Street Bridge and Falls Bridge respectively (in-situ field measurements also recorded);
- Started the Delaware at Trenton twice monthly monitoring in January 2017 and added Schuylkill in January 2018 as both account for the largest freshwater inflows to the Delaware Estuary;
- Parameter list includes: Chemical Oxygen Demand (COD), Chloride, Ammonia (filtered), Nitrate + Nitrite, Total Kjeldahl Nitrogen (TKN), Alkalinity, Silica, Total Solids (TS), Total Suspended Solids (TSS), Total Volatile Solids (TVS), Total Fixed Solids (FSS), Total Organic Carbon (TOC), Particulate Organic Carbon (POC), Dissolved Organic Carbon (DOC), Total Phosphorus (TP), Orthophosphate (SRP), Particulate Inorganic Phosphorus (PIP), and Chlorophyll-a (pheophytin corrected);
- All analyses (aside from chlorophyll-a) done by New Jersey Department of Health (NJDOH) Environmental and Chemical Laboratories. Chlorophyll-a analyses done by Academy of Natural Sciences (ANS). This is applicable for the Tributary Nutrient Monitoring project as well.
- Particulate Inorganic Phosphorus and CBOD-20 at 30 degrees Celsius added in April once-per-month (due to budgetary restrictions) per suggestion from LimnoTech;
- Issues with the test arose, so these analyses are put on hold during July while Doug Haltmeier with NJDOH completes laboratory experiments, which will be completed before the next monitoring event (7/31/2018). The increased temperature was a suggestion from the Expert Panel and is thought to emulate ultimate BOD without

having to conduct the 90-day tests, but modifications to the test are possibly underway.
- Results from 2017 monitoring of the Delaware at Trenton available in STORET;
- Results from 2018 monitoring of both rivers are coming in (so far received late-January through mid-April results);
- Collected wet-weather samples during mid-April independent of the twice monthly monitoring.

Tributary Nutrient Monitoring

- Once per month samples collected from 25 tributaries from Zones 2 – 5;
- Same parameter list as Delaware at Trenton & Schuylkill River Nutrients aside from silica and sulfate;
- Top 10 tributaries based on size of drainage area and coverage of Zones 2 – 5 were selected for Particulate Inorganic Phosphorus and CBOD-20 at 30 degrees Celsius analyses;
- Started monitoring later than expected due to snow and icy conditions (planned to monitor starting in March but started in April);
- Received April's data;
- Results from preliminary Tributary Nutrient Monitoring studies (2016 & 2017) available on STORET, but only 10 tributaries 4 times per year were monitored during those periods;
- The expanded Tributary Nutrient Monitoring list for 2018-2019 include:
    - Assunpink Creek, Neshaminy Creek, Crosswicks Creek, Poquessing Creek, Pennypack Creek, North Branch Pennsauken Creek, South Branch Pennsauken Creek, Rancocas North Branch, Rancocas South Branch, Frankford Creek, Cooper River, Big Timber Creek, Mantua Creek, Crum Creek, Darby Creek, Ridley Creek, Chester Creek, Raccoon Creek, Oldmans Creek, Brandywine River, Christina River, Salem River, Alloway Creek, C&D Canal, and Appoquinimink River (locations on tributaries occur above point-dischargers to avoid double counting)
- The end of the falling tide is targeted for sampling on tributaries that are below the head of tide;
- Collected wet-weather samples mid-April for a select number of nearby tributaries based on drainage area size (an opportunistic monitoring event that will lead to more intensive wet-weather sampling in 2019).

Point-Discharge Nutrient Monitoring

- Round 1 of Point-Discharge Monitoring from 2011 to about 2015 in order to later categorize dischargers into tiers (71 facilities during that time period);
- Tier 1 dischargers selected based upon total loading of Ammonia-N, TKN, or BOD-5 (top 95% contributors) while Tier 2 dischargers contribute top 95% of total loading of TP, SRP, Nitrate-N, or TN;
- 12 facilities are identified as Tier-1 dischargers (weekly monitoring) and 20 facilities identified as Tier 2 dischargers (monthly monitoring);
- Tier 1 facilities:
    - Philadelphia Water Department (PWD) Southwest, PWD Northeast, PWD Southeast, Lower Bucks County Joint Municipal Authority, DELCORA, Morrisville

borough Municipal Authority, Camden County Municipal Utilities Authority, Gloucester County Utilities Authority, Hamilton Township Wastewater Utility, Trenton Sewer Utility, Willingboro Municipal Utilities Authority, and City of Wilmington Department of Public Works

- Tier 2 facilities:
  - Bristol Borough Water & Sewer Authority, GROWS Landfill Waste Management, Mt. Holly Municipal Utilities Authority, Paulsboro Refining Company, Delran Sewerage Authority, Valtris Specialty Chemicals, City of Millville Sewage Treatment Authority, Cumberland County Utilities Authority, Bordentown Sewerage Authority, Moorestown Township WWTP, Burlington City Sewage Treatment Plant, Florence Township Sewage Treatment Plant, Riverside Water Reclamation Authority, Chemours Chambers Works, Mt. Laurel Municipal Utilities Authority, Pennsville Sewerage Authority, Cinnaminson Sewerage Authority, Delaware City Refining, Kent County Department of Public Works
- Required analytical parameters:
  - TP, TKN, Nitrate Nitrogen, Nitrite, BOD-20, CBOD-20, CBOD-20 amended method, COD, TOC, TSS, SRP, SKN, Ammonia Nitrogen, Discharge Flow, Water Temperature, Dissolved Oxygen, pH, Specific Conductance or Total Dissolved Solids (TDS)
- Received data from 12 of the 32 facilities and completing detailed check-ins of data (checking laboratory reports against the electronic data deliverables);
- Issues that come up with submissions are addressed sooner rather than later.

<u>Primary Productivity</u>

- All samples have been collected for 2018
- Sampling events occurred in early May and early July
- Approx. 60 total samples were collected from zone 2 to upper part of zone 5 across 5 transects
- Each transect consisted of near surface and near bottom samples collected at three locations, center channel, and one sample left of channel and right of channel
- PAR, water temp, DO, pH, and conductivity were recorded at each site.
- Samples were delivered to Tom Fishers lab at UMCES for primary productivity analysis
- Still awaiting results
- Primary productivity sampling is scheduled for summer 2019 as well

<u>Light Extinction</u>

- Eutro model expert panel suggested that DRBC collect light extinction measurements ro support the eutro model
- Goal is to better understand the relationship between light extinction and other routinely collected parameters
- This will allow us to better understand how to specify light extinction in the eutro model
- Scheduled for summer 2018, will begin shortly
- We will collect an array of parameters including PAR, CDOM, TSS, Chlorphyll a, turbidity, secchi depth
- Also water temp, DO, conductivity, and pH

- The goal is to collect a wide range of values for these parameters to best model the relationships between them
- To do this we will target several different three flow events, high, low, average
- 60 samples will be collected during each of three events
- Sampling locations range from zone 2 to upper portion of zone 5
- 15 locations were randomly selected in each of the four zones

Phytoplankton Identification and Enumeration

- Some level of estuary phytoplankton identification and enumeration analysis is anticipated for 2019, but details were still under development.

In response to the phytoplankton identification and enumeration project, Erik Silldorff of the Delaware Riverkeeper network noted that picocyanobacteria could be an important subset of Delaware Estuary phytoplankton biomass and are difficult to enumerate.

Group members asked when the next set of USGS cross-sections would be collected at the estuary water quality meters. DRBC agreed to coordinate with USGS, sending previous plots of cross-section results, and attempt to determine when future cross-sections might be collected.

DO Needs Evaluation Report by ANSDU

Dr. Richard Horwitz of the Academy of Natural Sciences of Drexel University (ANSDU) presented draft results of their work on dissolved oxygen concentration requirements of key oxygen sensitive species in the Delaware Estuary. This work was performed under two task orders issued by DRBC. The presentation is posted on the DRBC web site at: https://www.nj.gov/drbc/library/documents/WQAC/071818/horwitzANS_DOreq_key-species_DelEstuary.pdf

Under these task orders, ANSDU had:

1. Identified common or characteristic aquatic species in the Delaware Estuary (Trenton to mouth).
2. Determined a list of candidate key species that are suspected to be sensitive to low dissolved oxygen.
3. Determined where data gaps exist and identified sources and experts to fill in missing knowledge.
4. Reviewed secondary pathways of oxygen sensitivity.
5. Compiled literature data on dissolved oxygen requirements for candidate key sensitive species.
6. Narrowed candidate species list to key sensitive species.
7. Determined the seasonal occurrence of key sensitive species' life stages in the Delaware Estuary.
8. Determined the spatial distribution of key sensitive species' life stages in the Delaware Estuary.
9. Compiled dissolved oxygen concentration thresholds and/or associated endpoints for the key sensitive species and life stages.
10. Performed additional targeted literature searches and conducted internal and external review to identify additional sources of information on species sensitivity and spatial and temporal patterns if data gaps still exist.

11. Developed tables of dissolved oxygen requirements, such that the aggregate spatial and temporal dissolved oxygen need may be defined in support of development of new dissolved oxygen criteria for the Delaware Estuary.

Questions were answered through the presentation. Items of discussion included:

- Whether ANS found more toxicological studies on lethal effects versus sublethal. Members noted temperature effect studies on sturgeon at different life stages have been done.
- ANSDU noted that the Atlantic Sturgeon are an overarching species that occur through all life stages, end of larval stage to maturity, year-round throughout all WQ Zones of interest.
- The group discussed the reference for data on Atlantic Sturgeon from the federal register notice for critical habitat designation. Participants asked whether the notice was linked to actual scientific studies. ANSDU indicated that the scientific data behind the federal register can be requested.
- The group discussed data gaps including:
    - Data gaps for adult, egg, and larval Shortnose Sturgeon;
    - Species' stages at different temperatures;
    - DO requirements for many other species (including unionid mussels). Erik Silldorff mentioned there are studies of behavioral effects on mussels at different concentrations of DO in addition to lethal & sublethal effects data.

DRBC reminded participants that comments on the draft report (which was shared in June) should be submitted to DRBC by August 6, 2018.

Engineering Evaluation contract Update

John Yagecic of DRBC informed the group that DRBC had just entered into a contract with Kleinfelder to perform the engineering evaluation and cost estimation work for multiple effluent nitrogen thresholds. This contract was in response to the Request for Proposal discussed at the previous WQAC meeting. Under their proposal, Kleinfelder will provide technology recommendations and cost estimates for effluent concentrations of 10, 5, and 1 mg/L of ammonia, and 3 mg/L of total nitrogen for 12 wastewater treatment facilities discharging to the Delaware Estuary. John emphasized that this contract would provide planning level estimates only, and was not intended to replace any facility's detailed engineering design requirements.

The contract performance period is 2 years, with 6-month progress reports. DRBC agreed to provide regular updates following each progress report. John indicated that the Kleinfelder proposal was available upon request.

DO Early Action Workgroup Update

John Yagecic indicated that letters had been sent to 12 wastewater treatment facilities on behalf of the DO Early Action Workgroup to introduce the workgroup and to initiate on-site meetings with wastewater treatment representatives. The workgroup would begin scheduling meetings later this summer.

Water Quality Assessment Reports

John Yagecic and Ron MacGillivray updated the group on several water quality assessment products. The presentation is posted on the DRBC web site at: https://www.nj.gov/drbc/library/documents/WQAC/071818/yagecic_DRBC_WQ_AssessmentRpts.pdf

DRBC's Delaware River and Bay Water Quality Assessment, developed every even-numbered year, had been sent to EPA in spring 2018 and shared with state counterparts. Upon receipt and consideration of comments, DRBC will finalize the report and post on its web site. The Water Quality Assessment report is a criteria-driven report focusing on the proportion of observations which met criteria in the mainstem Delaware River during the 5-year assessment window. For the next iteration of the report (2020), DRBC is working toward automating the assessment and refining the thresholds that translate how the proportion of observations meeting criteria correspond to supporting the uses. DRBC will discuss the new thresholds at future WQAC meetings.

DRBC also completed Chapter 3 (Water Quality) of the Technical Report for Estuary and Basin (TREB) in cooperation with the Partnership for the Delaware Estuary (PDE). The water quality chapter of the treb focuses on indicators rather than criteria, long term trends, and is a basin-wide evaluation. The TREB was completed in 2017 and is posted on the PDE web site at http://www.delawareestuary.org/wp-content/uploads/2018/01/Chp3-water-quality.pdf

DRBC has spent effort on developing near-real-time assessments. These assessments provide a better understanding of current water quality conditions, allowing response actions which might include additional monitoring, notification of intakes, and possibly prescriptive remedial actions. DRBC's near-real-time water quality dashboard is located at: https://drbc.net/Sky/waterq.htm

DRBC also performs daily scans using real-time specific conductance data to infer multi-day rolling average chloride and sodium concentrations for comparison to criteria. John presented a brief case study of chloride criteria exceedance in early spring 2018. In response, DRBC notified intakes and provided periodic updates, shared data, and notified intakes again when the exceedance event had passed.

Uses and Criteria for contact recreation, Zones 3 & 4

John Yagecic presented information on the status and issues surrounding contact recreation in the Delaware Estuary. That presentation is posted on the DRBC web site at: https://www.nj.gov/drbc/library/documents/WQAC/071818/yagecic_recreational-criteria_DelEstuary.pdf

As indicated in DRBC water quality regulations, primary contact recreation is a protected use in all parts of the Delaware River except for Zone 3 and the upper portion of Zone 4, where secondary contact recreation is the protected use. Bacterial criteria are less stringent for secondary contact recreation in the DRBC regulations. DRBC prepared a report on attainability of swimmable water quality in 1988, which raised the recreational use to primary contact in most of the estuary, but deferred raising the use in Zones 3 and upper 4, citing lack of a CSO control program and uncertainty about whether criteria could be met.

Current documented activities in Zones 3 and upper 4 include jet ski use and paddleboard yoga, both of which could lead to contact with the water including inundation. Kayak rental has also expanded in Zone 3.

DRBC noted that in the intervening period since the 1988 attainability report:

- Long term CSO control programs have been initiated and continue to expand;
- Accurate models of CSO systems have been developed allowing prediction of volume and timing of discharge
- Efforts to reconnect regional urban areas to their waterfronts have developed and expanded
- DRBC has noted high levels of public / NGO interest in this issue
- Statistical models have been developed and demonstrated which provide guidance on current conditions relevant to contact recreation

Bart Ruiter expressed concern that revising the recreational use in Zones 3 and upper 4 could give the public a false sense of security. Mr. Ruiter noted that these waters are still subject to CSO discharge. Maya van Rossum expressed support for revising the use citing citizens' right to utilize the water body.

Jay Cruz mentioned another PWD web product called CSOcast to alert the public of possible Combined Sewer Overflows from Philadelphia's combined sewer system outfalls. This product was briefly demonstrated and is available at:
http://www.phillywatersheds.org/what_were_doing/documents_and_data/live_data/csocast

Jay Cruz also indicated that PWD had performed an analysis of recreational water quality and at that time the preliminary conclusion was that primary contact water quality standards were not attained in some cases. Tom Barron mentioned that Pittsburgh uses a flag system, and Jay Cruz indicated that within 5 years, Philadelphia expects to have signs.

The group agreed that DRBC should continue to collect information and feedback and provide an update at the next meeting, with a possible special meeting on this topic in the future.

Biological Monitoring & Assessment Program Review

Jake Bransky of DRBC gave a brief update on the status of a review of DRBC's Biological Monitoring and Assessment program. DRBC is in the process of updating and finalizing its biomonitoring methodology. As part of process, DRBC contracted with the Academy of Natural Sciences (Steff Kroll) to review the program. DRBC recently received the final report which included a comparison of DRBC's IBI to other regional IBIs and recommendations for the DRBC biomonitoring program. Major changes to the DRBC program were not recommended but some minor changes were suggested to potentially align DRBC's methods with PADEP's newly released SWMMI methodology. The next step in DRBC's biomonitoring review will be to convene a small group of experts to review the report and endorse potential changes.

NYU/NOAA sturgeon study

New York University and NOAA completed a study regarding the interactive effects of toxics and low dissolved oxygen on Atlantic Sturgeon. The authors recently submitted a final version to DRBC. The report is available from DRBC upon request.

Nutrient Criteria Development Plan Update

At the previous meeting (March 29, 2018) John Yagecic gave an update on a draft revised nutrient criteria development plan submitted to EPA. DRBC provided the draft plan to WQAC participants and asked for comments. At the next WQAC meeting, DRBC will discuss response to comments.

Erik Silldorff expressed concern that nutrient criteria tied solely to DO endpoints could miss other nutrient impacts to aquatic life.

Adjournment

Jay Cruz moved to adjourn the meeting and Tom Barron seconded the motion. The motion passed and the meeting was adjourned at 2:49 PM.