



Delaware River Basin Commission

25 Cosey Road
PO Box 7360
West Trenton, New Jersey
08628-0360
Phone: (609) 883-9500 Fax: (609) 883-9522
Web Site: <http://www.drbc.net>

Steven J. Tambini, P.E.
Executive Director

Minutes Water Quality Advisory Committee

June 14, 2022

Members & Alternates:

NYS DEC

Jason Fagel

EPA

Greg Voigt
Brent Gaylord

NJDEP

Frank Klapinski

Environmental

Erik Silldorff

Regulated Community Industrial

Bart Ruitter

National Park Service

Peter Sharpe

DNREC

Bhanu Paudel

PADEP

Josh Lookenbill

Academia/Science

John Jackson

Local Watershed Organizations

Erin Landis

Regulated Community Municipal

Bryan Lennon (PWD)

Other Attendees:

Steve Tambini (DRBC)

John Yagecic (DRBC)

Namsoo Suk (DRBC)

Fanghui Chen (DRBC)

Amy Shallcross (DRBC)

Bailey Adams (DRBC)

Beth Brown (DRBC)

Ron MacGillivray (DRBC)

Jake Bransky (DRBC)

Elaine Panuccio (DRBC)

Pam Bush (DRBC)

Sarah Beganskas (DRBC)

Kevin Pregent (DRBC)

Frank Borsuk (USEPA)

Kristen Bowman Kavanagh (DRBC)

Thomas Amidon (DRBC)

Jay Cruz (PWD)

Kelly Anderson (PWD)

Andy Thuman (HDR)

Patrick Rago (DRBC)

Paula Kulis (CDM Smith)

Kinman Leung (PWD)

Denise Hakowski (EPA)

Garret Kratina (PAFBC)

Helen Pang (NJDEP)

Jean Malafronte (ANDRIS Consulting)

Marco Alebus (NJDEP)

Bill Brown (PADEP)

Sheila Eyler (USFWS)

Steve Seeberger (NJDEP)

Jonathan Malzone (NPS)

Alissa Vanim (Aqua)

Brenda Gotanda (Manko, Gold, Katcher & Fox)

Leslie McGeorge (retired from NJDEP)

Eloise Gibby (Greeley and Hansen)

Josh Ferguson (Greeley and Hansen)

Charles Hurst (DELCORA)

Chris Ferdik (HRG)

Jason Fry (CCMUA)

Doug O'Malley (Environment New Jersey)

Eileen Murphy (NJ Audubon)

Meg McGuire (Delaware Currents)

Michael Dillon (Manko, Gold, Katcher & Fox)

Eliot Meyer (Hazen and Sawyer)

Eileen Althouse (CDM Smith)

Steve Jandoli (American Littoral Society)

Samantha O'Connor (PWD)
Michael Bott

Erik Silldorff (DRN)
Therese Wilkerson (DRN)
Pat Libbey (DRN)

Welcome and Call to Order

The meeting was called to order by Dr. Namsoo Suk of DRBC at approximately 9:35AM. Voting members were asked to introduce themselves.

Review of WQAC Minutes from May 18, 2022

Draft minutes from the May 18, 2022 meeting were distributed the previous day for review and comment. Minor corrections were recommended and made in real-time. Members approved the amended minutes unanimously. The approved May 18, 2022 minutes are posted on the DRBC web site at <https://www.nj.gov/drbc/library/documents/WQAC/051822/minutes.pdf>

Point Discharge Monitoring Results and Summary

Elaine Panuccio of DRBC presented results of point discharge nutrient monitoring performed by the dischargers in 2018 and 2019 with results provided to DRBC. Ms. Panuccio's presentation is posted on DRBC's web site at https://www.nj.gov/drbc/library/documents/WQAC/061422/panuccio_SummaryPtSourceNutrientMonData.pdf

In the first round of nutrient monitoring initiated in 2011, 71 point-discharge facilities within Zones 3 through upper 5 monitored for a 2-yr period. These results were used to characterize facilities as Tier 1, Tier 2, or Tier 3. During the eutrophication model calibration period (2018-2019) Tier 1 facilities performed weekly monitoring and Tier 2 facilities performed monthly monitoring. The model incorporates Tiers 1 – 3 facilities.

Point discharge monitoring in 2018-2019 yielded 39,608 datapoints for model input data. Ms. Panuccio presented box plots of both concentrations and loads (flow x concentration).

A review of the ratios of discharge of nitrate to ammonia nitrogen showed that majority of Tier 1 facilities, which include the largest municipal facilities, discharge relatively more ammonia than nitrate, impacting oxygen demand in the receiving water. By contrast, most Tier 2 facilities discharge more oxidized forms of nitrogen with less oxygen demand.

Ms. Panuccio summarized that the monitoring effort was completed and data were fully utilized for model development and calibration. She noted that high concentrations do not always indicate high loading facilities. The technical report is under internal review and will be released shortly.

DO Relative Stress Index

Dr. Sarah Beganskas presented a DO relative stress index. The index was developed to help translate model DO results into an aquatic life stress index to compare model runs. Dr. Beganskas' presentation is posted on the DRBC web site at https://www.nj.gov/drbc/library/documents/WQAC/061422/beganskas_DO_StressIndex.pdf

The index considers relative stress to aquatic life from low-DO events during different model scenarios, reflecting the magnitude, frequency, and duration of the events. The index also captures the conceptual understanding that a 0.5 mg/L DO difference at a lower concentration imparts more stress than the same differential at a higher concentration. Dr. Beganskas stressed that while the index characterizes stress to aquatic life, it is not a model of fish mortality or metabolism.

The algorithm to calculate the index first computes the difference between modeled DO values and an index threshold of 7 mg/L during the critical propagation season from May 1 through October 15. It determines a “severity exponent” for each DO value to account for rapidly increasing relative stress as DO decreases, and applies the severity exponent to each difference between modeled DO and DO index threshold. The algorithm then computes and normalizes the area under the curve. The severity exponent ranges from a value of 1 at DO values of 5 and higher, to a value of 2.5 at DO values of 2.5 and lower. Erik Silldorff suggested that changing values of the severity exponent beginning at DO concentrations of 5 rather than 6.3 was a controversial decision that could miss important differences, with increased mortality of young sturgeon below 6.3 mg/L (see Secor and Gunderson 1998, Niklitschek 2001, Niklitschek and Secor 2009 [part 1 study]).

Analysis of Attainability Progress Update

Thomas Amidon presented a progress update on the analysis of attainability including model results. Mr. Amidon’s presentation is posted on the DRBC web site at https://www.nj.gov/drbc/library/documents/WQAC/061422/amidon_UpdateonAA.pdf

Mr. Amidon reminded the WQAC of the elements of the Analysis of Attainability. Core modeling elements included design conditions, test scenarios, and metrics to compare scenarios. Elements for future discussion included selection of candidate scenarios, characterization of costs and benefits, and affordability evaluation.

Mr. Amidon indicated that the design condition methodology included 2012 hydrology and climate, with point discharges simulated at their permitted flows with concentrations set at the facility-specific 50th percentile of seasonal values from the 2018-2019 intensive monitoring period.

Preliminary simulations included:

- Baseline: 2012 actual conditions bathymetry adjusted for dredging depth
- Scenario-01: Baseline with Tier 1 discharges set to 1.5 mg/L ammonia
- Scenario-02: Baseline with Tier 2 discharges set to 1.5 mg/L ammonia
- Scenario-03: Baseline with Tier 3 discharges set to 1.5 mg/L ammonia

Presented results included longitudinal plots of the 2nd Percentile of DO concentrations, DO relative stress index results, and tabular DO-difference maps.

Next modeling steps include finalizing the design conditions and developing and running test scenarios. Individual WWTP sensitivity runs will be performed for Tier 1 for selected scenarios. Upcoming draft reports include the:

- Water Quality Model Calibration

- Socio-economic Evaluations
- Revised Linking Aquatic Life Uses with DO Conditions, and
- Analysis of Attainability

Bart Ruitter indicated that specifying point discharges at their permitted flow is conservative. Frank Klapinski noted that this assumption was consistent with NJ Total Maximum Daily Load (TMDL) calculations, and agreed it was conservative. Preston Luitweiler recommended that a model run should be made at actual flows for each simulation day as a sensitivity analysis and suggested that each conservative assumption assessed with a sensitivity run at realistic values to evaluate the impact of conservative assumptions. Mr. Luitweiler indicated that it was likely that dischargers seeking to meet a 1.5 mg/L ammonia target would actually have lower concentrations on many days, making this assumption conservative as well.

Adjournment

Bryan Lennon moved to adjourn the meeting and John Jackson seconded the motion. The meeting was adjourned at approximately 11:35 PM.