

# Water Quality Standards Advisory Committee (WQSAC)

## MEETING SUMMARY

Thursday, October 11, 2018 1:30 pm – 3:30 pm

NH Department of Environmental Services (NHDES)  
29 Hazen Drive, Concord, NH  
Rooms 112-114

### Attendees

Name	Organization	Attended WQSAC Meeting?
Clifton Bell	Brown and Caldwell	√ webinar
Andy Chapman	NHDES	√
Steve Clifton	Underwood Engineering	√
Gregg Comstock	NHDES	√
Sarita Croce	Town of Merrimack	√
Ted Diers	NHDES	√
Sam Demeritt	NH Wildlife Federation	√
Joel Detty	Normandeau Associates, Inc.	√
Ken Edwardson	NHDES	√
Haley Franz	NHDES	√
David Green	City of Rochester	√
Mark Hemmerlein	NHDOT	√
Ben Kirby	Hall and Associates	√ webinar
Stephanie Monet	NHDOT	√
David Neils	NHDES	√
Dean Peschel	Peschel Consulting	√
Melissa Paly	CLF	√ webinar
Kenneth Rhodes	Associated General Contractors of NH	√
Robert Robinson	City of Manchester EPD	√
Tracie Sales	NHDES	√
William Schroeder	NH Lakes Association	√
Jason Smith	NH Fish & Game Department	√
Stergios Spanos	NHDES	√
Paul Stacey	Consultant – Footprints in the Water	√ webinar
Jeanne Voorhees	EPA Region I	√ webinar
Ellen Weitzler	EPA Region I	√
Nicola Whitley	NH Fish & Game Department	√
Sherry Young	Rath, Young and Pignatalli	√ webinar

### Meeting Documents/Handouts

- Agenda
- Draft of 04/12/18 WQSAC Meeting Summary (20180412\_wqsac\_mtgsum\_DRAFT to WQSAC.pdf)
- EPA Update documents (20181011\_EPA\_Update.pdf)

- Presentation - Frequency and Duration Analysis of Merrimack River Study Results by Ken Edwardson (20181011\_NHDES\_Freq-Dura-Merrimack-ACOE-Study.pdf)
- Presentation - 7Q10 Alternatives for Nutrient Permitting by Ken Edwardson (20181011\_NHDES\_7Q10\_Alternatives.pdf)

Meeting Documents/Handouts available at:

<https://www.des.nh.gov/organization/divisions/water/wmb/wqs/meetings/2018/index.htm>

Note: This meeting was also offered as a webinar via GoToMeeting.

### **1) Introductions**

The meeting began with a round of introductions including those who participated remotely via the webinar.

Ken Edwardson, Senior Scientist at NHDES, was introduced as the new Water Quality Standards Program manager.

### **2) Approval of 4/12/18 Meeting Summary**

No comments were received on the 4/12/18 meeting summary attached to the email sent to the WQSAC.

### **3) Legislative Updates**

No new water quality related bills have yet been listed. The Legislative Service Requests (LSRs) are just beginning to be posted. They will really begin to show up in December.

In the last session, two identical PFAS bills passed and were signed into law. HB 1101 and SB309 included a number of provisions:

- Addresses air discharges contaminating groundwater
- NHDES authorized to adopt administrative rules and to initiate rule making by January 1, 2019 to establish both Maximum Contaminant Levels (MCLs) and Ambient Groundwater Quality Standards (AGQSs) for PFOA, PFOS, PFHxS, and PFNA
- Required NHDES to create a plan to address surface water quality standards for the four PFAS compounds
- Toxicologist and Health Risk Assessor funded and hired (10/2018)

Relative to delegation of NPDES program authority to NHDES, SB 450 was passed and signed. This bill, as written, created an NPDES advisory committee and allocated \$350,000 toward studying and planning for delegation. However, the financial resources were stripped from the bill. NHDES has requested that those resources be added to the budget for FY2020. We will not know what is in the Governor's budget request until February 2019. The House will then take up the budget, passing something to the Senate in March. The Senate will act and then the House will have to vote on that version. Finally, the Governor signs the budget in June and it takes effect July 1.

Ted Diers reported that NHDES is essentially level funded. Priorities for additional state resources for the Watershed Management Bureau include a position for Instream Flow (which is

about to publish rules this week that will be in place by end of year), and a position to focus on cyanobacteria. This past summer, we had cyanobacteria warnings on 40 lakes, which is about double the usual amount. We also had many beach advisories for e coli.

#### **4) EPA Updates**

EPA reported that they have created a Cooperative Research and Development Agreement (CRADA) for Aquatic Life Bioavailability Modeling for Metals. The group of scientists and industry people will develop a common modeling approach to predict bioavailability of different metals under different conditions (pH, DOC, etc.). Their report will go out for peer review and public comment. EPA was asked if independent research groups in addition to the 8 metal associations will be involved. EPA indicated that was likely the case.

EPA reported that the Aluminum Aquatic Life Criteria Update is nearly complete. The draft was published in July 2017 and public comments were accepted until October 2017. They anticipate releasing a final criteria document by end of calendar year 2018, and implementation materials in 2019.

EPA is publishing new tech support materials for the new Selenium ALUS criteria which was finalized in 2016.

EPA lead a number of national leadership summits on PFAS this past spring (one was in Exeter, NH). Monitoring is challenge because it's such a broad class of compounds. EPA is trying to develop a national PFAS management plan. EPA was asked about a technical bulletin in Sept 2018 regarding testing non-drinking water for PFAS. The bulletin referenced holding time as an issue (28 days to 45 days). EPA agreed to look into the issue of holding times.

#### **5) Dissolved Oxygen Update**

NHDES reported that some progress has been made and that work is happening but slower than we would like. Currently, NHDES is waiting for NHFG to produce species information which will be sent to EPA to process through the Virginia Province methodology. Massachusetts is also working on similar DO issues (specifically in the Taunton River and Mt. Hope Bay). It appears they are taking a step back and may take another year. At this time, it is not clear they are going to use VA province approach. The MA process has already undergone a public comment period on the first phase of their study. As such, it might make sense to explore what MA has done once they have released their research so we don't recreate the wheel. They have developed a draft white paper on Sturgeon. As has been noted before, there are a number of problems with the VA province method (fish species and lab methods). NHDES reported that they currently have three major water quality standards issues at hand, including, DO, 7Q10 for nutrients, and PFAS. Each of these is a major WQS endeavor. NHDES hopes that next meeting will focus on DO but it will depend on progress that can be made. **NHDES agreed to share the recent coalition letter regarding dissolved oxygen with the WQSAC.** We may also start discussions of PFAS plan at the next meeting.

#### **6) PFAS update**

As required by SB309 in 2018, DES will develop a plan for creation of surface water quality standards by Jan 1, 2020 for all uses.

“RSA 368:8 Department of Environmental Services; Surface Water Quality Standards. The commissioner of environmental services shall develop a plan, including a schedule and cost estimates, to establish surface water quality standards for perfluorooctanesulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), and perfluorohexanesulfonic acid (PFHxS) in class A and class B waters for all designated uses. The commissioner shall submit the plan upon its completion, but no later than January 1, 2020, to the house resources, recreation, and development committee and the senate energy and natural resources committee.”

The Drinking Water Groundwater Bureau is required to develop MCLs for these same chemicals by Jan 1, 2019. There are 3 public information sessions next week.

Discussion: Fish tissue sampling is likely in Merrimack and has occurred at the Coakley landfill. A major study by Harvard to be published soon which covers fish tissue in 10 or 15 NH waterbodies. Sarita Croce noted that Dumpling Brook in Merrimack has PFAS at 290 ppt to 500 ppt. Ted said we are aware of this effort. Ted noted we only have a couple hundred surface water PFAS samples because it's so expensive (~\$200/sample). There is no fund in state governmental for a lot of paired samples such as tissue and water column. Sarita Croce also noted that when looking at GenEx compounds it is very different than PFOA and they are going to behave differently. As such, it might make sense to her to look at the other compounds too, if we can. Ted said that one thing that may come up is should we develop a total PFAS criteria for all PFAS chemicals. Sarita suggested looking at the comments from last night's meeting at Merrimack which often suggested looking at the larger picture. Bill Schroeder asked, given the upcoming publication of the Harvard Study, if there is much data on levels in fish, birds etc. that causes harm. Ken Edwardson responded there is some data for impact on death in fish etc. but we may not necessarily know how much will impact growth, reproducibility, etc. Bill Schroeder had conversations with the Loon Association who are concerned if PFAS affects loon growth, reproduction problems etc., but they do know it affects other birds. Ted noted that as part of the PFAS water quality standards discussion, we will have to find this type of information. Steph Monette (DOT) asked if any attention will be given to leaching from soils. Sarita, based on last night's meeting, noted that this is just beginning to be studied per the Office of Research and Development and will be soil specific and that even humics can play a role.

## **7) Frequency and Duration Analysis of Merrimack River Study Results**

As part of the Merrimack River Study discussion at the last meeting, the question was asked “What does the model say about the frequency and duration of elevated chlorophyll-a (chlor-a)?”

Ken Edwardson presented a number of slides that included responses to different specific questions to help to answer this question. The specific questions and responses are provided below:

Q: When is chlor-a high and for how long? A: For most of the summer and for prolonged periods with longer duration events have the highest modeled chlor- a median.

Q: The relationship between the event median and maximum? A: In general the maximum chlor-a concentration of a given event exceeds the median by 60%.

Q: Under what flow conditions do chlor-a exceedances typically occur? A: Exceedances rarely occur above the summer median flow, but are common under the summer and August median flows.

Q: How long do chlor-a events last under a given flow condition? A: Events are short when flows are above the summer median but get very long in duration as flows drop below the summer and August median flows.

Q: How severe (in terms of duration) are chlor-a events under a given flow condition AND how often did those flows happen in the summer (May-Oct) from 2002-2016? A: Minimal when flow exceeds the summer median but more to much more severe when flow is under the Summer and August medians. In the summer (May-Oct) from 2002-2016, flow < Summer median 47% of the time.

Q: How do all measured chlor-a values compare to modeled values 2002-2016? A: The model generally overpredicts chlor a.

Q: In the paired 01-MER and Model dataset, what flows had high chlor-a? A: Both datasets show high chloro-a below the summer median flow. Note that additional samples taken near the border on dates outside of the 2001-2016 period also had high chlor-a.

Discussion: Clifton Bell asked why the model overpredicts chlor-a. Gregg Comstock responded that the model was calibrated to chlor-a but was not intended to predict the absolute magnitude on any particular day for the years studied. In other words, it is reasonably good for predicting trends but not for predicting a specific value under a specific condition or on a particular day. Paul Stacy further noted that since the model predicts water column chlor-a but not benthic chlor-a, much of that growth may be on the bottom in the photic zone.

## **8) 7Q10 Alternative for nutrient permitting**

Ken Edwardson presented a set of slides that first discussed regional and neighbor states criteria, then described various analysis of statewide total phosphorous and flow data, and finally looked at existing WWTP loads and limits relative to the statewide data. It was noted that the NPDES program is meant to be preventative, and that permit limits must be established to meet surface water quality standards. Ken also noted that different rivers may behave differently to similar levels of TP due to many other factors.

These various analyses are summarized below:

Regional context – Ecoregional assessment of the lowest 25<sup>th</sup> percentile of TP for NH would be between 10 and 31 ug/L. It had been suggested in previous meetings and correspondence that NH look to other states for guidance on appropriate approaches and levels. Some of these were FL, MN and OH. Each of these occur in very different ecoregions that have much higher ambient TP levels. The recently developed nutrient criteria in ME and VT fall within the ecoregional numbers and were developed using a stressor-response approach.

NH ambient TP levels – Data on TP from hundreds of river sites were compiled and compared to flow levels. At flows either at the August median or 1.5 times 7Q10, the ambient TP concentration in NH rivers is around 13 ug/L and 20 ug/L in impoundments. This raised the question of whether TP concentrations increase as flow decreases. The answer after looking at many sites is “no” except in those rivers with a significant WWTP effluent contribution. Further

analysis revealed that the summer median TP levels are elevated in streams with WWTP contribution but not enormously – 20 (n=20) vs. 13 (n=654) ug/L.

Impairment Analysis - Summer TP in NH rivers and impoundments were compiled based on whether there are impairments to the swimming designated use due to high chlorophyll-a or cyanobacteria; or to the aquatic life designated use due to high chlorophyll-a, TP, low dissolved oxygen, degraded macroinvertebrates or degraded fish community. There was a significant difference in TP between the impaired (19 ug/L) and full support (12 ug/L) rivers and no detectable difference between the impaired (24 ug/L) and full support (21 ug/L) impoundments.

Current WWTP loads and limits – There are 59 WWTPs in NH with NPDES permits. 23 (39%) of them have TP effluent limits written into the permits. In general, the facilities who enjoy higher dilution rates are those without TP limits (except where there are other facilities discharging to the same river).

Potential impact to permitted loads under different flow frequencies – Given that other states in the region (Vermont and Maine) use flows equal to or less than the August median as flow frequency statistic for nutrients, and the fact that a month is sufficiently long for most waterbodies to exhibit the effects of nutrients on water quality (i.e., plant growth, dissolved oxygen, pH, etc.) NHDES ran a number of analyses to investigate the how use of the August median might impact nutrient limits for NPDES permittees. The bottom line is that it would affect each WWTP differently. An analysis of 7Q10 and August median shows that flow goes below the 7Q10 an average of 2 days/year and below the August median 62 days/year. Comparing the 7Q10 and August median for each WWTF by watershed area, shows remarkably different results. The 7Q10 versus watershed area is much less varied than the August median. It would not be a simple switch for all permittees; that is, there is no common multiplier that could be applied to all permittees to determine the August median flow based on the 7Q10 flow.

Predicting load limits under a different flow and concentration – Given that EPA noted that using a different flow would not allow them to use the “Goldbook” TP value of 100 ug/L for reasonable potential calculations, NHDES ran some analyses to evaluate the impact of changing both TP and flow. Given the other data in the presentation (ecoregional numbers, other state’s criteria, and ambient TP) a TP concentration of 30 ug/L and a flow statistic of August median were used for illustrative purposes. This approach showed that for many WWTPs with TP limits, their limit would not change (either because the value was similar or because of antibacksliding). For a handful of WWTPs, their limit would drop under that scenario.

Discussion: Ted Diers stated that we are not making a proposal at this moment, rather we wanted to show the potential impact of one scenario. Replacing 7Q10 with the August median seems like a reasonable alternative. Next steps may be to develop guidance or a rule for permit writers. One option would be to just say the flow is August median, change rule and leave it at that, which would leave permitting methods up to the permit writers. While our analysis used 30 ug/L, we could run other numbers. A number of other options include: developing a numeric water quality standard for TP, creating TMDLs in those places with impaired waters, return to using the 7Q10 at 100 ug/L TP (not a bad deal for most WWTPs even if it is not a great way to get to number), looking at the rivers in the northern and southern parts of the state differently. He recommended that folks think about these options and continue discussions next meeting.

Dean Peschel: Trying to fit square peg in one whole. Rivers behave differently. Understands antibacksliding. For those WWTF that don't have limits, its important they not be treated in a simplistic way. The question is whether the stream is being impacted as a result of the discharge? Ted Diers noted that we could add monitoring requirements to do something like that. But that the monitoring could be significant.

Ellen Weitzler: The idea for different criteria for different types of waterbodies makes sense. But note that EPA doesn't have to wait for impairment for permit limit. Permit gives them license to discharge. It's what they could legally discharge. Ellen has worked with VT who has combined biological and numeric criteria for TP; they have 8 different biological indices and if any are impaired the waterbody is considered impaired. VT doesn't wait for it to be impaired before they apply a permit limit. They track it.

Clifton Bell: Picking a single number is wrong but is pleased to hear the idea of guidance. NHDES missed an opportunity to address that streams react differently. Evaluate state of stream to determine what the limit should be. A level of 30 ug/L could seriously impact communities without any environmental benefit. Coalition sent letter in May to put emphasis on biological data and how to address antidegradation of high quality streams. Using 30 ug/L and a single flow isn't going to go over well with some.

Paul Stacey: WWTFs do not have precise control of the TP level they can discharge. Perhaps more of a technology based limit is appropriate. Also the nonpoint source pollution should be considered. With regards to relationship between chl and TP in the Merrimack River model, the model may have been adjusted for DO which is why DO went up. TP includes mineral and phytoplankton, if you look at stream data some of TP can be lower because it is in the algae [benthic]. It might be possible to sharpen relationship between TP and phytoplankton and to also look at ortho TP.

Ellen Weitzler suggested they look at NPDES fact sheet for background if communities want to estimate impact on their permit limit.

Sarita Croce: It costs Merrimack \$4M to dispose of sludge. She asked about setting up subcommittees for PFAS and 7Q10. Didn't think DO subcommittee met frequently enough. Would like more frequent meetings so they can go through the process with us. Ted Diers responded that we are trying to allocate resources as best we can but running subcommittees takes a lot of time, mostly because the work needed in between meetings. Sarita noted that she is sampling upstream and downstream with buy-in from EPA.

Ellen Weitzler: **EPA has a fact sheet regarding combined criteria (what is this?) and will send it to DES for distribution to the WQSAC.** She said it was challenging getting EPA HQ to agree to it.

Ted Diers: CT has completely different approach that resulted in 90% reduction in WWTF loads.

Clifton Bell: Can we also look outside of NE too? Some of more flexible approaches are outside of Region 1.

## **9) Next Steps**

- a. NHDES will get the NHFG species information to EPA as soon as they have it in hand.
- b. Participants will report back on the items in bold text above.
- c. NHDES will prepare a draft meeting summary for review.

## **10) Other Business**

*Next WQSAC meeting:* The next WQSAC meeting is scheduled for January 11, 2018 at 1:30 pm.

*List of Potential Future WQSAC meeting topics:* A running list of potential future WQSAC meeting topics and their status (presented in no particular order) is attached.

## **11) Adjourn**

The meeting was adjourned at approximately 3:30 pm.

**List of Potential Future WQSAC Meeting Topics and Status**  
**Last Updated 04/04/19**

Topic	Description	Status
PFOA & PFOS Criteria in Env-Wq 1700	In October, 2016, NH adopted emergency rules to establish an ambient groundwater drinking water standard of 70 ppt for PFOA & PFOS. The emergency rule lasts 180 days. There are currently no criteria for PFOA or PFOS in Env-Wq 1700 for the protection of aquatic life or human health (added by NHDES in Sept 2017)	07/2018 <ul style="list-style-type: none"> <li>• SB 309 – NHDES to make plan for WQStds.</li> </ul> 12/2018 <ul style="list-style-type: none"> <li>• Toxicologist and health risk assessor hired.</li> </ul>
Acute and Chronic Toxicity definitions (Env-Wq 1702.02 and 1702.10)	Should the definitions be more broad? (from July 2016 comments on IP <sup>1</sup> by OOE <sup>2</sup> <small>Error! Bookmark not defined.</small> ).	
Nuisance species (Env-Wq 1702.33 and 1703.03(c)(1)d)	Should nuisance species be better defined because it's too subjective? Should it include a list of "invasive" plants? How do you determine if a waterbody is degraded by development or if it's due to the natural lake aging process? (from July 2016 comments on IP by NHFG <sup>3</sup> )	
Designated Uses (Env-Wq 1702.16 and 1703.01)	How should conflicts between designated uses be resolved (e.g., aquatic life (which depend on plants for habitat) and boating or swimming (which can be adversely impacted by too many plants)? (from July 2016 comments on IP by NHFG).	

<sup>1</sup> IP means Initial Proposal;

<sup>2</sup> OOE means Osprey Owl Environmental, Inc.

<sup>3</sup> NHFG means New Hampshire Fish and Game Department

**List of Potential Future WQSAC Meeting Topics and Status**  
**Last Updated 04/04/19**

Topic	Description	Status
Dissolved Oxygen Criteria (RSA 485-A:8 II, IIa., Env-Wq 1703.07)	In 2017, RSA 485-A:8, II was revised and 485-A:8, IIa., was added that requires DES Commissioner to adopt rules relative to DO water quality standards in a manner that is consistent with EPA guidance on fresh and tidal DO water criteria published pursuant to section 304(a) of the CWA, and other relevant scientific information. (from July 2016 comments on IP by GBMC <sup>4</sup> and others)	In progress. Subcommittee formed and first meeting held 10/13/16. 10/13/2016 <ul style="list-style-type: none"> <li>• NHDES-Current Crit., History, Other NE States, Issues, Start 02/09/2017</li> <li>• Pennsylvania Apprch. 04/13/2017</li> <li>• NHDES-Why D.O.</li> <li>• NHDES-D.O. and temp.</li> <li>• NHF&amp;G-FW Fish/Life stages</li> <li>• NHDES-EPA 1986 FW Crit. Doc. 09/08/2017</li> <li>• SB127- a) D.O.%Sat. removed, b) NHDES to adopt D.O. criteria 10/12/2017</li> <li>• EPA-Glen Thursby – Va. Prov. Apprch. 02/2018 – NHDES DO data to EPA 01/11/2018 WQSAC meeting               <ul style="list-style-type: none"> <li>• NHDES-Update. NHFG to generate species info.</li> </ul> </li> <li>04/12/18 WQSAC meeting               <ul style="list-style-type: none"> <li>• NHDES-Update 10/11/2018</li> <li>• NHDES-Update 12/2018 – Marine Fish Info; NHFG to NHDES to EPA</li> </ul> </li> </ul>
Tidal nutrient related assessment procedures (Env-Wq 1703.14)	Do the nutrient related assessment procedures for tidal waters for dissolved oxygen, chlorophyll a, water clarity, macrophytes, epiphytes and eelgrass need to be revisited? (from July 2016 comments on IP by GBMC).	
EPA Human Health Criteria methodology and assumptions (Env-Wq 1703.21, Table 1703-1)	Are the risk factors, body weight, drinking water intake rates, bioaccumulation factors used by EPA to develop 304(a) recommended human health criteria appropriate? Should DES adopt the EPA 304(a) recommended criteria for 94 chemicals finalized in 2015? (from July 2016 comments on IP by OOE).	
Chloride Criteria – (Env-Wq 1703.21, Table 1703-1)	Should chloride criteria be revised?  Note - EPA disapproved Missouri’s proposal to adopt Iowa’s criteria in 2015 (not scientifically defensible and may not be protective based on recent toxicity tests using mussels).	

<sup>4</sup> GBMC means Great Bay Municipal Coalition

**List of Potential Future QQSAC Meeting Topics and Status**  
**Last Updated 04/04/19**

Topic	Description	Status
Aluminum Criteria – (Env-Wq 1703.21, Table 1703-1)	EPA issued draft freshwater criteria for aluminum in July 2017. The comment period closed 9/26/17. Should DES adopt the revised criteria once it is finalized? (from DES, 9/7/16).	12/2018 - EPA provided V2
Assimilative Capacity (Env-Wq 1705.01)	Should the 10% reserve for future growth be maintained? (from July 2016 comments on IP by City of Rochester).	
River flows for calculation of permit limits (Env-Wq 1705.02)	Should the 7Q10 river flow be used to calculate nutrient related permit limits or should a seasonal flow be used? (from July 2016 comments on IP by City of Rochester).	In progress. 09/08/2017 <ul style="list-style-type: none"> <li>• SB127-Nutrient limits based on flow &gt; 7Q10</li> </ul> 10/12/2017 <ul style="list-style-type: none"> <li>• Topic was introduced at WQSAC meeting.</li> </ul> 01/11/2018 WQSAC meeting <ul style="list-style-type: none"> <li>• NHDES-Background</li> <li>• EPA-Permit Calcs</li> <li>• Clifton Bell-Alternatives</li> </ul> 04/12/2018 <ul style="list-style-type: none"> <li>• NHDES-Recap &amp; Applying other States to a NH permit site</li> </ul> 10/11/2018 <ul style="list-style-type: none"> <li>• NHDES-Alternative scenarios</li> </ul>
Bacteria: Seasonal (versus year-round) disinfection of WWTF effluent	Current regulations require year-round disinfection of WWTF effluent. Some other NE states do not require disinfection during the winter months. Should NH WWTFs be allowed to do the same? Would require rule change and likely a statute change.	
Presentation	NHDES Monitoring Strategy	
Presentation	Pollutant Tracking and Accounting Pilot Program (PTAPP) being developed for the coast	
Presentation	Trends of Mercury in Fish Tissue	
Presentation	River Order used in the Shoreland Protection Act	