

## WQSAC Meeting 1/11/2018

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## Legislative Update

- **HB 1714** – requires NHFG to collect and analyze fish tissue samples from all stocked waterbodies and fish stock sources for PFCs, PCBs and mercury. 01/16/2018 at 11:00 AM
- **HB 1590** – requires NHDES to initiate rulemaking for certain PFCs. 1/11/2018
- **HB 1618** – requires NHDES to to initiate rulemaking for MCLs, ambient groundwater and surface water quality standards for certain PFCs. 1/11/2018
- **SB 450** – establishes advisory commission to study delegation of the NPDES program to NHDES. No hearing scheduled.

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## EPA Update – EPA Launches Cross – Agency Effort to Address PFAS (12/4/2017)

- Identify a set of near-term actions that EPA will take to help support local communities.
- Enhance coordination with states, tribes and federal partners to provide communities with critical information and tools to address PFAS.
- Increase ongoing research efforts to identify new methods for measuring PFAS and filling data gaps.
- Expand proactive communications efforts with states, tribes, partners and the American public about PFAS and their health effects.
- See <https://www.epa.gov/newsreleases/epa-launches-cross-agency-effort-address-pfas>

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## EPA Update – PFAS Detection Methods

- EPA 537 Version 1.1 is only EPA-approved method for sampling 14 PFAS compounds in finished drinking water.
- No validated, standardized analytical methods for PFAS compounds in media other than finished drinking water
- 2 ASTM methods for 21 PFAS compounds in other media established by EPA Region 5 Chicago Lab
  - ASTM D7968-14 for soil and sediment
  - ASTM D7979-15 for water, sludge, influent, effluent, and wastewater
- See [https://www.epa.gov/sites/production/files/2017-04/documents/pfas\\_methods\\_tech\\_brief\\_09mar17\\_final\\_508compliant.pdf](https://www.epa.gov/sites/production/files/2017-04/documents/pfas_methods_tech_brief_09mar17_final_508compliant.pdf)

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## EPA Update - Freshwater Aquatic Life Criteria for Aluminum

- EPA is working on the response to comments, including recommendations to consider additional data.
- Responding to these comments will likely result in different final 304(a) criteria for aluminum.
- EPA anticipates publishing the final Al criteria in 2018.
- Given the anticipated publication in 2018, EPA strongly recommends that states wait for EPA to finalize its 304(a) before adopting revised criteria into state law.

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## DO Subcommittee Status

- EPA (Glen Thursby) review of Great Bay DO data is in process.
- NHFG (Cheri Patterson) is gathering data on sensitive species, life stages, etc. in Great Bay.
- Next meeting tentatively scheduled for 4/12/18.

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## Flows for Calculating Nutrient Permit Limits

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## Topics Covered

- Background (Gregg)
  - Existing Rules and Changes to Statute
  - Why was the Statute Changed?
  - Focus of Today's Discussion
  - Why TP control is important in Freshwaters
  - Factors that can impact ambient response of WWTF  
TP loading
  - Nutrient related criteria and thresholds in NH
- How NH NPDES TP limits are calculated (Dan Arsenault of EPA)
- Ideas for alternative stream flows for nutrient permitting (Clifton Bell of Brown and Caldwell)

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## Existing Rules

- **Env-Wq 1705.02** Low Flow Conditions.
- (a) The flow used to calculate permit limits shall be as specified in (b) through (d), below.
- (b) For tidal waters, the low flow condition shall be equivalent to the conditions that result in a dilution that is exceeded 99% of the time.
- (c) For non-tidal rivers and streams, permit limits for all human health criteria for carcinogens shall be developed based on the long-term harmonic mean flow, which is the number of daily flow measurements divided by the sum of the reciprocals of the daily flows.
- (d) For non-tidal rivers and streams, permit limits for all aquatic life criteria and human health criteria for non-carcinogens shall be based on the 7Q10 flow.
- **Env-Wq 1702.01** "7Q10" means the lowest average flow that occurs for 7 consecutive days on an annual basis with a recurrence interval of once in 10 years on average, expressed in terms of volume per time period.

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## 2017 Changes to RSA 485-A

*RSA 485-A:8, II: "The commissioner shall not calculate nutrient discharge limits for aquatic life and human health criteria based on 7Q10 flow or such other flow criteria more restrictive than 7Q10."*

*RSA 485-A:2, XXIV. "'7Q10' means the lowest average flow that occurs for 7 consecutive days on an annual basis with a recurrence interval of once in 10 years on average, expressed in terms of volume per time period."*

(This is the same as Env-Wq 1702.01)

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## Why was the Statute Changed?

- According to Rochester and Great Bay Coalition: “The 7Q10 was derived for toxics permitting and is inconsistent with the frequency/duration elements of nutrient-related impacts in streams” and some other states use higher flows for nutrient permitting (examples are given). (9/2/16 letter from Brown and Coldwell to NHDES Commissioner).
- In other words, use of the 7Q10 to establish WWTF nutrient permit limits may be too conservative.
- The above assumes that nutrient related impacts in rivers/streams take longer than 1 week under low flow conditions to cause WQS exceedances, which may or may not be true (depends on many factors).

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## Focus of Today’s Discussion

- Nutrients include Total Phosphorus (TP) and Total Nitrogen (TN)
- Focus of today’s discussion is on the methodology for setting total phosphorus (TP) limits in NPDES WWTF permits
  - in free-flowing Class B freshwater (FW) rivers and streams that do not discharge directly to a lake, pond or impoundment (with lake-like characteristics),
  - which do not have a site specific TP criteria established (none currently exist in NH), and
  - which do not have a TP TMDL established.
    - If a nutrient TMDL has been completed, the wasteload allocation (WLA) for the WWTF in the TMDL would be used to establish the nutrient permit limit.

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## Why TP Control is Important

- Usually the limiting nutrient in fresh waters
- TP is not toxic but can cause water quality (WQ) violations which can impair designated uses such as recreation and aquatic life:
  - Excessive plant growth including rooted plants (weeds), floating algae (phytoplankton) and attached algae (periphyton – fuzzy rocks).
  - High Turbidity due to phytoplankton or dead periphyton
  - Low dissolved oxygen (DO) due to respiration of plants and decay of plants when they die.
  - High pH due to uptake of CO<sub>2</sub> during photosynthesis and low pH due to increased CO<sub>2</sub> during respiration
  - Adverse impacts on the benthic community

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## Factors That Can Impact Ambient Response of WWTF TP Loadings

- Magnitude and location of nutrient loadings from other point and nonpoint sources
  - Upstream (Background) and Downstream
- Form of TP – dissolved is more readily bioavailable than particulate
- Flushing rate of waterbody
  - Low flushing rates/ higher residence times are more prone to algae growth
- Clarity / Light Penetration
  - High Clarity / Light encourages plant growth
  - Clarity impacted by algae, color (from natural humic/tannic acids), high flows which can cause scour, suspend sediment and detach periphyton
- Temperature
  - High Temperature means higher plant growth rates
- Assimilative capacity of response parameters such as DO, pH and chlor a
  - If waterbody is close to violating standards now, it will not be able to handle as much TP loading as a healthier waterbody.

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## Existing NH TP Criteria – Only narrative

- Env-Wq 1703.14 Nutrients.
- (a) Class A waters shall contain no phosphorus or nitrogen unless naturally occurring.
- (b) Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring.
- (c) Existing discharges containing phosphorus or nitrogen, or both, which encourage cultural eutrophication shall be treated to remove the nutrient(s) to ensure attainment and maintenance of water quality standards.
- (d) There shall be no new or increased discharge of phosphorus into lakes or ponds.
- (e) There shall be no new or increased discharge containing phosphorus or nitrogen to tributaries of lakes or ponds that would contribute to cultural eutrophication or growth of weeds or algae in such lakes and ponds.

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## Existing NH TP Criteria – Only narrative

- Env-Wq 1702.15 “Cultural eutrophication” means the human-induced addition of wastes that contain nutrients to surface waters, resulting in excessive plant growth or a decrease in dissolved oxygen, or both.

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## NH Numeric Criteria and Thresholds for Nutrient Response Parameters

- Criteria in rule (Env-Wq 1700)
  - Dissolved Oxygen (Env-Wq 1702.15)
  - pH (Env-Wq 1702.15)
  - Turbidity (Env-Wq 1702.15)
- Thresholds in CALM (not in rule)
  - phytoplankton chl a (but not periphyton chl a)
    - Numeric translator of General Water Quality Criteria (Env-Wq 1703.03 – free of color or turbidity that make water unsuitable for designated uses)
  - Benthic Index of Biological Integrity
    - Numeric translator of narrative for Biological and Aquatic Community Integrity (Env-Wq 1703.19)

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## How NH NPDES TP Limits are Calculated

- See presentation by Dan Arsenault of EPA titled “Calculation of total phosphorus limits for NPDES permits in New Hampshire”
  - IMPORTANT to keep in mind that:
    - NPDES permits must be written to meet surface water quality standards (including antidegradation), and
    - Draft NPDES permits are issued for public comment.

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## Ideas for Alternative Stream Flows for Nutrient Permitting

- See presentation by Clifton Bell of Brown and Caldwell titled “Review of Streamflows for Nutrient Permitting”

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## Discussion and Next Steps

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