

Proposals for Changes to Maine Water Quality Standards Under Triennial Review

This proposal by the Friends of Graham Lake (FOGL) is for DEP to develop turbidity standards in order to protect Maine waters.

1. Citation of Standards (no changes proposed)

The intent of the Maine Legislature could not be clearer, in 38 MRSA 464 1. **Findings; Objectives; Purpose** we read the following:

The Legislature declares that it is the State's objective to restore and maintain the chemical, physical and biological integrity of the State's waters and to preserve certain pristine state waters. The Legislature further declares that in order to achieve this objective the State's goals are:

- A. That the discharge of pollutants into the waters of the State be eliminated where appropriate;
[PL 1985, c. 698, §15 (NEW).]

Maine law prohibits discharges to surface waters and specifically mentions turbidity and impacts to existing uses.

38 MRSA 464(4)(A)(4) prohibits the following:

(4) Discharge of pollutants to waters of the State that imparts color, taste, turbidity, toxicity, radioactivity or other properties that cause those waters to be unsuitable for the designated uses and characteristics ascribed to their class;

Maine law clearly states that state waters that are naturally clear of suspended solids (like the Union River) are expected to remain that way.

38 MRSA 464 (4) (B) reads as follows:

B. All surface waters of the State shall be free of settled substances which alter the physical or chemical nature of bottom material and of floating substances, except as naturally occur, which impair the characteristics and designated uses ascribed to their class. [1985, c. 698, §15 (NEW).]

Maine has good laws that protect our waters from pollutants, including turbidity, but without rules to enforce them DEP is helpless.

2. Details of Proposed Changes

Turbidity standards could be established in statute or rule. The FOGL have no preference. Since the law is clear that state waters should be free of settleable solids except as naturally occur, and because swimming and recreational waters must be clear for public safety reasons, FOGL propose the following:

For Great Ponds and Class A rivers, streams, and brooks, settleable and suspended solids shall be as naturally occur, and be less than a 3-day average of 5 NTU based on a turbidity logger sampling at hourly intervals.

For Class B and Class C rivers, streams, and brooks, settleable and suspended solids shall be as naturally occur, and be less than a 3-day average of 10 NTU based on a turbidity logger sampling at hourly intervals.

For Class SA, Class SB and Class SC estuarine and coastal waters, settleable and suspended solids shall be as naturally occur, and not reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonally established norm.

These proposals allow for shifting of natural stream bed load during storm freshets by allowing short-term spikes as long as the 3-day average is low. A numerical value is provided as a threshold for when anthropogenic sediment sources require enforcement action. We acknowledge that natural background conditions in some estuaries may not be currently knowable.

For agricultural communities with massive non-point source pollution issues, enforcement can probably be adjusted by adoption of Standard Operating Procedures where unresolved problems can result in intervention, such as a 5-year mandatory use of cover crops.

3. Justification and Supporting Documents

Problem Statement: Maine has no numerical standards for turbidity and defaults to the narrative standards. This has the effect of preventing turbidity enforcement and the clean-up of long-term problems like those in the lower Union River.

Our experience in the recent relicensing of the Ellsworth hydroelectric dams shows that the narrative standards are a poor way of preventing turbidity or enabling enforcement. In spite of knowing that Graham Lake is a source of turbidity and that Graham Lake is a listed impaired water due to the fluctuations in water level caused by the dams (see DEP 305b reports), the dam owner Brookfield was not required to do a turbidity study, identify the problem, and propose solutions.

Brookfield was not given a turbidity target to meet (since there is no such thing). In 2013 Black Bear Hydro (the previous owner) did limnological studies. They measured oxygen, total phosphorus, nitrogen, pH, temperature, secchi depth, turbidity and other lake parameters twice a month. DEP concluded the lake was “turbid” but “does not show signs of nutrient enrichment.” Brookfield was not required to do a proper turbidity study. The Friends of Graham Lake had to do a 3-year study with almost daily resolution during the ice-free seasons (to save time, samples were not taken when the river looked clean). We found that the higher and lower water levels in Graham Lake led to the greatest impact to water quality. We proposed that limits on the water level fluctuations in Graham Lake be imposed to control the problem. FERC incorporated those limits in Brookfield’s draft Environmental Impact Statement. However, the burden of proof should be on the applicant, not on the applicant’s neighbors.

Narrative standards have not been helpful. Macroinvertebrate assessments in the lake were not possible at the time since the drawdowns eliminated the entire littoral zone. The aquatic community that needed to be assessed did not exist. Brookfield was asked to sample macroinvertebrates in the Union River below the Graham Lake dam. The river communities were found to not meet Class B standards in 2014, 2015, and again in 2019. DEP staff commented that this might be due to a “lake effect.” Turbidity and sediment embeddedness which are well documented in the lower river, were not mentioned in the DEP reports. This is a problem with the narrative standard. If the standard is not met, it is difficult to tell what caused the impairment. After all, it might be a totally natural lake effect of warmer and lower oxygen waters below an impoundment. DEP needs to have a turbidity action threshold where the state can step in and fix the problem.

Some photos of the Union River are inserted here to illustrate the turbidity that was common before Brookfield was required to minimize the water level fluctuations on Graham Lake.



Turbidity in the Union River below the Graham Lake dam, at US Rt 1A. The first picture is below Rt 1A and the second photo is upstream.



Photos of Graham Lake (1 and 3) and of the Union R at US Rt 1A bridge (photo 2) taken on a day the river was clear in order to illustrate the sediment impact to the river bottom. Notice substantial river bottom embeddedness.



Drone photos of Branch Lake Stream where it enters the Union River to contrast a natural stream with the muddy Union River. Branch Lake is the City of Ellsworth water supply.

Maine's highest water quality classifications (GPA and Class A) should be clean and clear. Class B and C waters may have some seasonal turbidity due to winter road salt-sand applications. These are typically the worst at first flush in the spring but have short duration, so a 3-day average of hourly values would allow that. Estuaries and coastal waters can be naturally influenced by wave action on extensive mud flats. Some action threshold is needed so that anthropogenic sedimentation can be controlled.

4. Impacts on Stakeholders

FOGL expect that dam owners with shallow turbid reservoirs would be one of the most important stakeholders. However, given the intent of the Maine legislature and the need for Maine citizens to enjoy their own waters, and for the needs of wildlife, dam owners should already be operating their facilities in such a way as to minimize turbidity. Turbidity standards would make it enforceable. If a standard is universal, then it becomes incorporated in the cost of doing business. No one business is disadvantaged. Some dams in the more marginal situations might not continue to be economically viable. The loss of some hydropower would be offset by improvements in fisheries. In the Union River, the value of the elver fishery alone and with 2 dams in place is currently worth more than the electricity.

FOGL expect that farmers would be another major stakeholder. Intensive agriculture in the Aroostook River valley has made many rivers and streams in Aroostook County brown and turbid. Again, this is something that should already be illegal but needs a solution. Farmers will not like having to change practices. However, farmers benefit only in the short term from ignoring soil loss and poor husbandry; and there are long term benefits from conservation BMPs that make farms more sustainable, productive and profitable. Cover crops for instance reduce soil loss, increase soil tilth, and increase soil organic content. These make growing conditions better, with less need for water or chemical inputs. Soil husbandry practices have been shown to increase climate resilience for farms. There should already be money for state and federal conservation programs that would help farmers meet soil conservation goals. Maine's soil conservation districts and the USDA Natural Resources Conservation Services exist for this very purpose. These soil BMPs are now almost 100 years old.

Municipal public works crews would need to clean up in the spring after winter road maintenance practices. Since everyone benefits from clean water, there

should be state programs that provide funds to help municipal road crews, such as shared vacuum or sweeper trucks. We believe there are already trucks and other equipment owned by MDOT that can be leased to towns. Road drainages might need to be modified to include sedimentation basins and other BMPS such as those already required for Maine salmon river watersheds.

Wastewater Treatment plants already have TSS discharge limits appropriate for the water quality classification of the receiving waters. Stormwater permits and construction projects already have discharge limits and mandated sedimentation control plans. No changes are anticipated for these permit holders.

Maine DEP is a stakeholder that will have to enforce new turbidity standards. There are estuaries where enforcement may be impossible either because there is no documented natural background condition or no on-going anthropogenic sources, and thus no obvious solution. In these cases, this proposal is no different than the present condition.