



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION



JANET T. MILLS
GOVERNOR

GERALD D. REID
COMMISSIONER

October 25, 2019

Senator Nate Libby
Senator Ned Claxton
3 State House Station
Augusta, Maine 04333

RE: Potential Upgrade of the Lower Androscoggin River

Dear Senator Libby and Senator Claxton:

This is to follow up our meeting on September 30, 2019 with Ed Friedman, Peter Rubins, and Ferg Lea. Also, in attendance was Rob Mohlar, Department water quality engineer. We discussed the potential water quality classification upgrade of the lower Androscoggin River from Class C to Class B. At the close of the meeting Rob and I committed to reviewing the Department’s current water quality models for the upper and lower Androscoggin River so that we could better determine if the lower Androscoggin River could attain the more stringent Class B standards if it were upgraded. This letter summarizes our findings and provides additional information on water quality standards and the waste discharge licensing process that we discussed at the meeting and that are important considerations in any reclassification process. I’ve also included a summary of previous reclass legislation.

Summary of Findings:

The existing models provide sufficient information to support the Department’s previous assessment that there is no feasible approach to ensure attainment of Class B dissolved oxygen criteria in the lower Androscoggin River. Based on these studies, the Department does not recommend that this section of the Androscoggin River be upgraded to Class B at this time.

Water Quality Standards:

State water quality standards (standards) are generally established pursuant to Maine law, including provisions in Maine’s water classification program, 38 M.R.S. §§464-470. Standards are comprised of the following three components: designated uses, criteria, and an antidegradation policy. Standards may be established in law or rule and must be consistent with the Clean Water Act and approved by the Environmental Protection Agency.

Designated uses are the uses specified in law that water quality must support such as supporting aquatic life and human activities, such as swimming and fishing. They are used to determine water quality criteria, which must protect designated uses and serve as the basis for water quality-based discharge permit limits. The following are the designated uses

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

specified at 38 M.R.S. §465 for Class B and C waters. Most uses are similar. Differences in uses are underlined.

- **Class B:** drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as habitat for fish and other aquatic life. The habitat must be characterized as unimpaired.
- **Class C:** drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as a habitat for fish and other aquatic life.

Water quality criteria are limits on conditions in a water body. Criteria protect particular designated uses, such as habitat for fish and other aquatic life, recreation, and drinking water supply. Criteria can be expressed as acceptable levels (constituent concentrations) or as narrative statements.

Some major components of the statutory criteria for Class B and C waters are summarized below:¹

Class	Dissolved Oxygen	Bacteria (<i>E.coli</i>)	Habitat	Aquatic Life (Biological)
B	Not less than 7 ppm; or 75% of saturation.	May not exceed geometric mean of 64/100 ml over 90-day interval or 236/100 ml in more than 10% of samples in any 90-day interval from 4/15 to 10/31.	Habitat for fish and other aquatic life; unimpaired.	Support all aquatic species indigenous to the receiving water; no detrimental changes to the resident biological community.
C	Not less than 5 ppm; or 60% of saturation.; 30-day avg. 6.5 ppm.	May not exceed geometric mean of 100/100 ml over 90-day interval or 236/100 ml in more than 10% of samples in any 90-day interval from 4/15 to 10/31.	Habitat for fish and other aquatic life.	Support indigenous fish; maintain the structure and function of the resident biological community.

¹ See 38 M.R.S. §§465.3 and 465.4 for a full description of the statutory criteria in those provisions applicable to Class B and C waters.

For context, as a percentage, Maine's rivers and streams are classified as follows:

Class	%
AA	6.3
A	47.2
B	45.4
C	1.1

The Class C waters are generally located in areas with a relatively large population and/or industrial base relative to the size of the water body. All of the rivers below the remaining six pulp and paper mills are classified as Class C for at least some portion of the river. These are the St. John, St. Croix, Androscoggin, Kennebec, and Presumpscot.

The state's Antidegradation Policy, 38 M.R.S. §464.4.F, addresses among other things protection of water quality for existing uses, protection of high-quality waters, and Outstanding National Resource Waters.

The following provision found at 38 M.R.S. §464.4.F.4. has been previously discussed in the context of a reclassification of the lower Androscoggin River.

“When the actual quality of any classified water exceeds the minimum standards of the next highest classification, that higher water quality must be maintained and protected. The board shall recommend to the Legislature that that water be reclassified in the next higher classification.”

The Department recognizes that under certain conditions, and in certain locations, the lower Androscoggin River meets the criteria for Class B waters. However, the Department's long-standing interpretation of 38 M.R.S. §464.4.F.4. is that it must generally be read in the full context of the water quality laws including the sections of law that establish the conditions under which a discharge may be licensed.² The Department's interpretation is where any criterion of water quality (for example, dissolved oxygen) exceeds the minimum standards of the next highest classification under critical water quality conditions, then that higher water quality criterion must be maintained and protected. Critical water quality conditions include, but are not limited to, conditions of low flow, high water temperature, and licensed loading from point source discharges.

This interpretation does not consider a waste water discharge to be an existing use, but it does recognize the legal condition that exists when a waste discharge license is issued. In addition, it recognizes the findings that the Department had to make to issue any waste discharge license, in particular the finding that, “The discharge, either by itself or in combination with other discharges, will not lower the quality of any classified body of water

² See DEP Antidegradation Waste Discharge Program Guidance, June 13, 2001, prepared in consultation with EPA, the DEP Division of Environmental Assessment, and the Maine Attorney General's Office.

below such classification.”³ This finding is based in part on the critical flow condition specified at 38 M.R.S. §464.4.D, “Except as otherwise provided in this paragraph, for the purpose of computing whether a discharge will violate the classification of any river or stream, the assimilative capacity of the river or stream must be computed using the minimum 7-day low flow that can be expected to occur with a frequency of once in 10 years.”

Based on the above, the Department’s position remains that 38 M.R.S. §464.4.F.4. does not require the Board of Environmental Protection (BEP) “recommend to the Legislature that that water be reclassified in the next higher classification” solely based on monitoring data that is not representative of critical conditions. However, the Legislature is not precluded from enacting a reclassification if it chooses to do so.

Permitting Process:

The Department is authorized by the Environmental Protection Agency (EPA) to implement the waste discharge licensing requirements of the Clean Water Act. The Department also implements the waste discharge licensing requirements established in Maine law at 38 M.R.S. §§411-424-B. and 38 M.R.S. §464.4., and various Department regulations.

As specified at 38 M.R.S. §464.4.A.8., the Department may not issue a waste discharge license for, “Discharges for which the imposition of conditions cannot ensure compliance with applicable water quality requirements of this State or another state”. This is an important requirement when a reclassification is being evaluated. Licenses that contain discharge limits that currently ensure attainment of Class C criteria, may not be adequate to ensure Class B criteria are attained under the conditions required by law. If that is the case, the license limits would need to be made more stringent to ensure the new Class B criteria can be attained. In some cases, depending on the specific conditions of the water body, it may not be possible to create a licensed condition that ensures attainment of a higher classification. As explained below, this is the situation with the Androscoggin River.

The important summary of the above is that a reclassification to a higher class creates legally binding licensing requirements that must be met. These are not only goals, they also carry legal requirements. Also, in water bodies that are not attaining their classification, the licensing of any new or increased discharge would be prohibited if the discharge would contribute to the non-attainment. It is highly recommended that the Legislature fully understands any new licensing requirements that will be imposed on any discharge prior to a reclassification decision being made.

History of Lower Androscoggin Reclassification Requests:

- 2009 – During a water reclass review process the Department made recommendations to the BEP to not upgrade the Lower Androscoggin due to lack of data. The Lower Androscoggin was not included in the BEP upgrade recommendations to the Legislature. The Friends of Merrymeeting Bay testified in

³ 38 M.R.S. §414-A.1.A.

favor of the upgrade during a public hearing on the reclassification bill. The Legislature requested the Department conduct necessary studies “to determine if the section of the Androscoggin River from Worumbo Dam in Lisbon Falls to the line formed by the extension of the Bath-Brunswick boundary across Merrymeeting Bay in a northwesterly direction meets, or can reasonably be expected to meet, the criteria for reclassification from Class C to Class B.”

- 2010 – The Department completed river sampling.
- 2011 – The Department completed *Lower Androscoggin River Basin Water Quality Study Modeling Report (March 2011)*. The Report findings did not support reclassification as there was not an identified way to ensure that the more stringent dissolved oxygen standard of 7 mg/L for Class B could be met even with the complete elimination of the wastewater discharges from the Lewiston Auburn Water Pollution Control Authority (LAWPCA) and the Town of Lisbon.⁴
- 2011 - L.D. 154, *An Act to Change the Classification of the Lower Androscoggin River*. The Department testified in opposition to this L.D. based on model results. The bill was placed in Legislative files (DEAD) pursuant to Joint Rule 310.3.
- 2013 - L.D. 845, *An Act to Change the Classification of the Lower Androscoggin River*. The Department testified in opposition to this L.D. based on model results. The ENRC voted ONTP 11-2 and ultimately the bill was not passed.
- 2018 – Statewide reclassification proceedings. The Department recommended to the BEP that the lower Androscoggin River not be included with upgrade reclassifications for ten other water bodies. (In addition to the lower Androscoggin, the Department also did not recommend two other water bodies for upgrade). The BEP agreed with this recommendation.

Department Water Quality Models for the Upper and Lower Androscoggin River:

Water quality models are computer models that use inputs of water quality monitoring data, discharge data, and various input parameters to simulate and predict water quality conditions under various scenarios. They are very useful to determine potential attainment status when considering a change in water classification. Models can be used to simulate attainment status of water quality criteria such as dissolved oxygen at critical conditions that are required as part of the waste discharge licensing process. The models used by the Department are developed and supported by EPA.

The Department has developed two water quality models for the Androscoggin River. The upper Androscoggin model was completed in 2005 and was used as the basis for the issuance of renewal waste discharge licenses for discharges in the upper Androscoggin from New Hampshire to Gulf Island Dam, and for the relicensing of the Gulf Island Dam in 2005.

⁴ See additional discussion of model findings below under the heading Department Water Quality Models for the Upper and Lower Androscoggin River.

The lower Androscoggin model was developed in 2011 as noted above.

Upper Androscoggin Model

The upper Androscoggin is Class C from the confluence with the Ellis River at Rumford Point to the Gulf Island Dam. One of the primary issues with the 2005 relicensing process was the non-attainment of the dissolved oxygen criterion in the lower portions of the impoundment (Gulf Island Pond) created by Gulf Island Dam and non-attainment with the designated use of “recreation in and on the water” due to periodic algal blooms within the pond. This licensing process was the most technical and legally complex waste discharge licensing process the Department has ever undertaken. In the end, renewal permits were issued to the pulp and paper mills in Jay and Rumford and the municipal wastewater facility in Livermore Falls, and a water quality certification was issued for Gulf Island Dam that included various water quality-based limits and operating conditions that would allow Class C criteria to be met.

An important aspect of this process was the finding that the Class C dissolved oxygen standard could not be attained without the use of an instream oxygenation system. This system is in the upper reaches of Gulf Island Pond (at upper and lower narrows) and injects oxygen into the water column from June 1 – September 30. This type of “in stream” treatment system is extremely rare. There are no other systems like it in Maine and very few others in the country. Under federal and state regulations, it can only be used to meet water quality based limits if, among other things, the technology-based treatment requirements are not sufficient to achieve the standards, and the alternative selected has been demonstrated to be a preferred environmental and economic alternative to achieve the standard after consideration of alternatives such as advanced treatment, recycle and reuse, land disposal, changes in operating modes and other available methods.

The findings of this model are explained in the Department reports: *Androscoggin River Total Maximum Daily Load – Final (May 2005)* and *Addendum to the Androscoggin River 2005 Total Maximum Daily Load (May 2010)*.

An important finding of the 2005 TMDL and the 2010 addendum that is relevant to the discussion of upgrading the lower Androscoggin is that that even with all point sources at zero discharge, and various oxygen injection configurations, there would be non-attainment, and marginal attainment, of the Class B standard of 7 mg/L of dissolved oxygen from river mile 44 (approximately one miles below Twin Bridges) to river mile 27 (Gulf Island Dam).

This point is very important to any discussion of upgrading the lower Androscoggin because the water that flows from Gulf Island Pond into the lower Androscoggin contributes 97% of the boundary condition flow for any modeling of the lower Androscoggin. In summary, there is no feasible approach to create a condition in Gulf Island Pond where Class B criteria for dissolved oxygen (7 mg/L) could be attained under critical conditions.

Lower Androscoggin Model

Important findings of the lower Androscoggin model that indicate there is no feasible approach to ensure attainment of proposed Class B dissolved oxygen criteria include:

Within the lower section of the river, during critical low flow conditions, 97% of the flow is from the main stem of the river, 2.5% is from the Little Androscoggin River, 0.4% is from the Sabattus River, and 0.1% is from the Little River.

The increased depth, volume, and decreased velocity in the impoundments diminish the reaeration rate and depress the overall dissolved oxygen concentration. These impoundments also create slow moving segments that accumulate organic sediment, which also decreases the dissolved oxygen concentration.

During critical water quality conditions of low river flow, high water temperature, and maximum licensed discharge from the Publicly Owned Treatment Works, the model predicts dissolved oxygen concentrations will be below the Class B criterion of 7.0 mg/L in eight of the twelve river segments from the confluence with the Little Androscoggin River in Auburn to the Brunswick-Topsham Dam. Predicted dissolved oxygen concentrations were below the Class B criterion of 7.0 mg/L for all segments from the Worumbo Dam to the Brunswick-Topsham Dam. This model run was based on the least conservative measured dissolved oxygen boundary condition of 7.69 mg/L. When using a modeled dissolved oxygen boundary condition of 7.0 mg/L all twelve segments indicate non-attainment. When using the most appropriate boundary condition of 5.0 mg/L that reflects the current Class C dissolved oxygen criteria of the upper Androscoggin and the Little Androscoggin River that comprise the boundary condition, all twelve segments indicate non-attainment, with five of the segments more than 0.5 mg/L below the Class B criteria. Non-attainment is primarily driven by periphyton respiration during non-daylight hours. (Periphyton are algae that grow attached to submerged objects such as logs, rocks, plants and debris.)

The river sampling showed a nutrient loading from sources upstream of the study area. A separate model run was performed to assess the effect of these upstream sources relative to the point source discharges within the study area. After completely removing the discharges from the Lewiston-Auburn Water Pollution Control Authority and the Lisbon Wastewater Treatment Facility, the water quality model predicted dissolved oxygen concentrations would still be below the Class B criterion of 7.0 mg/L in two of the twelve fresh water river segments based on the least conservative measured dissolved oxygen boundary condition of 7.69 mg/L.

While the sampling data showed nutrient loading from sources upstream of the study area, these loads are not considered excessive. Nineteen of the 21 phosphorus samples taken during the 2010 sampling period indicate phosphorus levels below the numeric ambient criteria for Class B waters the Department is considering for rulemaking. The diurnal swings in dissolved oxygen of approximately 1 mg/L driven by periphyton respiration during non-daylight hours are also not considered excessive.

Summary:

In summary, the existing models provide sufficient information to support the Department's previous assessment that there is no feasible approach to ensure attainment of Class B

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dissolved oxygen criteria in the lower Androscoggin River. Based on these studies, the Department does not recommend that the lower Androscoggin River be upgraded to Class B at this time.

Please contact me at 287-7700, or brian.w.kavanah@maine.gov if you have any comments or questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'B. Kavanah', with a stylized flourish at the end.

BRIAN KAVANAH

Director, Bureau of Water Quality

Cc: Rob Mohlar, Don Witherill, Susanne Meidel, Barry Mower,
Gregg Wood, Cindy Dionne - DEP
Ed Friedman, Friends of Merrymeeting Bay
Peter Rubins, Grow L+ARWG
Ferg Lea, ARWC