



CONSERVATION LAW FOUNDATION

Tom Danielson
Bureau of Land and Water Quality
Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

July 31, 2009

***Re: Comments of Conservation Law Foundation ("CLF") on DEP's Draft Chapter 583
Nutrient Criteria for Fresh Surface Waters***

Dear Tom:

The Conservation Law Foundation ("CLF") appreciates the opportunity to comment on the Maine Department of Environmental Protection's ("DEP") June 2009 Draft Chapter 583 Nutrient Criteria for Fresh Surface Waters.

CLF is a nonprofit, member-supported organization with offices in Maine, Massachusetts, New Hampshire, Rhode Island and Vermont. CLF has advocated for New England's environment since 1966, working to protect the region's people, natural resources and communities. One of the primary aspects of CLF's advocacy involves the area of water quality protection. We are commenting upon this draft rule, as it will affect our mission and membership through its regulation of point source and non-point source discharges of nutrients to Maine's fresh surface waters.

With this rule, DEP has undertaken to craft nutrient criteria that strike the difficult balance between a highly waterbody-specific regulatory regime and a more generalized "one standard fits all" approach. The compromise contained in this rule is to apply nutrient standards and criteria to categories of waterbodies and to design those standards and criteria such that they address, to the greatest extent possible, the waterbody characteristics likely to be found within each category. CLF appreciates the challenge inherent in properly defining these categories and applying appropriate standards to each. We also expect that, given the relative novelty of both the regulation of nutrients and the use of this approach, this rule will develop, to some extent, in an iterative fashion over time.

With that said, we want to ensure that Maine puts its best foot forward in setting these initial standards. To that end, through these comments CLF recommends that DEP: 1) expand the number

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of categories of waterbodies, 2) develop and issue simultaneous with the final rule, guidance as to the methods of performing the various sampling that comprise the environmental response criteria, 3) amend the rule to grant DEP and its staff greater authority to use its best professional judgment in determining impairment of waterbodies, 4) strengthen the rule by lowering the total phosphorus limits and 5) make various changes to the environmental response criteria to ensure that these methods accurately identify the status of a given waterbody. We address these issues in more depth below.

Expand the Waterbody Categories – Tables 2 and 3

In Tables 2 and 3 of the draft rule, DEP evidences its recognition that the characteristics of rivers and streams can vary depending upon the existence of certain features including its water quality, depth or status as an impoundment, by providing separate waterbody categories for each such feature. GPA surface water (lakes and ponds) should similarly be broken-down into additional sub-categories to ensure that common differences among lakes and ponds, that have implications for the assessment of nutrient impairment, are accounted for. Lakes and ponds can differ substantially depending upon their size, depth, hydrogeologic setting and other features, all of which can significantly influence water quality. We recommend that the rule more clearly distinguish rivers and streams from lakes and ponds and that it establish categorical distinctions for varying kinds of ponds and lakes.

Specifically, CLF recommends that DEP amend Tables 2 and 3 to divide GPA surface waters into additional categories that include river or stream-flow influenced lakes or ponds, kettle hole ponds and three categories of lakes or ponds based upon depth: 2 meters or less, 2-4 meters and greater than 4 meters in depth. Lakes or ponds influenced by rivers or streams are unique in that the water quality can be driven primarily by incoming surface waters, especially with a minimal residence time. On the other hand, a kettle hole or groundwater-dominated lake or pond is generally influenced more so by the quality of the incoming groundwater. A distinction between lakes of differing water depths is also important because the development of thermoclines and related water column stratification at various depths can have a measurable influence on the overall water quality of a lake or pond.

Develop Sampling Guidance

Section 4 of the draft rule appears to contemplate that sampling will be performed by DEP staff as well as by third parties. In recognition of the likelihood that sampling will be performed by non-DEP staff, and to ensure the consistency and accuracy of the sampling methodology used for each environmental response criterion, CLF urges the DEP to develop guidance, in the nature of a quality assurance protocol or plan, that delineates in detail each sampling criterion and a set of associated standard operating procedures that must be followed when undertaking water quality assessments.

The plan must delineate clear and appropriate criteria and experience requirements for qualified samplers. At a minimum, it should require the sampler to have an appropriate science degree, applicable training through the DEP or substantial experience adhering to a sophisticated QAPP.

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In implementing the guidance, DEP should sponsor training for samplers and monitors to ensure maximum consistency for all protocols.

The timing of routine sampling, identified in Section 4(B), requires some additional clarification. As written, it is not clear how the likely difference in water quality between May 1st-Oct 31 for lakes, and June 1-Sept 31 for streams, will be handled from a regulatory perspective. It is likely that there will be greater quantities of algae and phytoplankton growth and therefore diminished transparency and higher chlorophyll in the later weeks and months of these timeframes. Does DEP intend to use seasonal averaging of sampling results? We recommend that this section be amended to describe the need for consistency of seasonal sampling and to provide for a regulatory review process that takes these inevitable seasonal differences into account. We also recommend providing generic guidance as to how long after precipitation events sampling should be undertaken to achieve what the draft rule describes as “ambient conditions.” This could likely be achieved by simply defining the term “ambient conditions” within the rule.

Best Professional Judgment

Chapter 583 affords DEP the discretion to use its best professional judgment when making impairment decisions in the context of “atypical situations.” CLF urges that the DEP broaden the applicable use of this discretion to allow staff to rely upon their experience and the existence of conditions that are indicative of eutrophication, but that do not readily fit into the categories of environmental response criteria, in making an impairment determination. Well-trained scientists have experience and instincts developed over years of encountering situations that cannot be neatly categorized and those considerations can frequently be the most important facet of a water quality assessment.

Selection of Appropriate Environmental Response Criteria

Section 3 requires that at least one of the environmental response criteria must be measured in performing an impairment assessment. This provision should go a step further and require that the sampler, using his or her best professional judgment, to select a method from among those prescribed for a given waterbody type, must apply the *most appropriate* environmental response criterion or criteria, and that this judgment should be based upon the nature of the waterbody and the conditions associated with it.

Secchi Disk Usage Section (3)(B)(1) :

The Secchi Disk criterion provides that, if a Secchi reading taken in a pond or lake exceeds 2 meters, it is indicative of an unimpaired situation. This conclusion fails to take into consideration the very real possibility that some lakes could render a 2 meter Secchi reading and still have an overabundance of nutrients, algae and phytoplankton. This can be particularly true in lakes having higher water quality. This possibility highlights the need for DEP staff to use their professional judgment in determining impairment and the importance of expanding the range of categories of lakes and ponds in Table 3, as advocated above.

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This section also indicates that the Secchi criterion should not be utilized in waters less than 2 meters deep. CLF disagrees with this artificial limitation. Secchi measurements in waters shallower than 2 meters serve as a good, simple, water quality yardstick when accompanied by other site-specific information relevant to the waterbody and is an excellent indicator of gradual seasonal changes.

Water Column Chlorophyll Section (3)(B)(2):

CLF recommends that this criterion could be improved by expanding it beyond a mere chlorophyll criterion to a total mass of phytoplankton measurement. This would be accomplished by requiring measurement for both chlorophyll *a* and pheophytin *a*. The pheophytin measurement would then be added to the reading for water column chlorophyll *a*, so that the total mass of phytoplankton measured includes those that are alive and those that are dying off. Both have an influence on clarity and failure to account for both may result in an underestimation of transparency influences. Tables 2 and 3 would need to be amended to incorporate these changes, and to establish a new numeric standard applicable to total mass of phytoplankton .

Percent Algal Cover Section (3)(B)(4):

Further guidance is required as to the appropriate method of performing this measurement, in order for this to be a useful parameter. Specifically, it is not clear how one selects the particular section of river or stream to be measured. Chapter 583's accompanying *Description of Nutrient Criteria for Fresh Waters (Chapter 583)* guidance document is clear as to the logistical process to employ but does not clarify how one selects a section of the river that is representative of the stream segment. For example, impeded flow areas or large rocks on the bottom would be likely places for algal build-up, but this substrate may not be representative of the segment. As currently written, it is not clear whether this would be an appropriate sampling location?

Moreover, as drafted, this criterion applies only to rivers and streams less than 1 meter deep. It appears that DEP is assuming that if water is deeper than 1 meter the oxygen demand will be acceptable despite the density of algae cover. This will not, however, always be the case. The rule should account for this potential by allowing for this criterion to be utilized despite depth if other parameters indicate an impaired condition and there is algal cover on the substrate.

Dissolved Oxygen Section (3)(B)(6):

Page 22 of the *Description of Nutrient Criteria for Fresh Waters (Chapter 583)* guidance document discusses the important implications of day to night fluctuations in the levels of DO in a given waterbody. This phenomenon could significantly affect the biological functions and health of waters and would not be ascertainable using the currently proposed sampling approach. CLF appreciates DEP's suggestion that it may consider including DO flux as a criterion in the future, once more information on its significance has been developed. As discussed below, CLF urges that DO flux be added now as a parameter. However, to the extent that DEP elects to take a more conservative approach and does not add a DO flux criterion, CLF recommends that, at a minimum, DEP include in its DO environmental response criterion a requirement that DO measurements be taken twice a day, with one in the morning and the other at night. If evening decreases in DO are

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significant, despite day time recoveries, this should be noted and taken into consideration, along with results relative to other parameters, particularly if there are regular and identifiable circumstances that reduce day time DO. This additional data should help DEP fully ascertain the role of DO flux in waterbody impairment.

Phosphorus Criteria and Decision Tree Section (3)(C)(1-5):

The total phosphorus limits proposed in the draft rule are higher than those found in comparable waters in Massachusetts and Vermont (some in advanced eutrophic states) and more than EPA's Eco-Region 8 and 14 recommendations.

The EPA Eco-Region guidance divides its waterbodies into two categories: lakes and ponds, rivers and streams. It also separates the state of Maine into two regions, one the "the nutrient poor, glaciated northeast," and the other the "eastern coastal plain." The following concentrations are generally representative of the data EPA acquired for these regions:

Eco-region 8 Glaciated Northeast

Streams and Rivers: P approx. 10-12 ppb

Lakes: P approx 8 ppb

Eco-region 14 Eastern Coastal Plain

Streams and Rivers: P approx 31.25 ppb

Lakes: P approx 4 ppb

Generally, these concentrations for phosphorus and chlorophyll are considerably lower than those in the Chapter 583 draft.

On Cape Cod, groundwater-fed kettle hole ponds are considered to have excessive phosphorus at 20 ppb and 10 to 15 ppb phosphorus is considered to be good water quality. Lake Champlain in Vermont is divided into 12 segments for regulatory purposes. The phosphorus TMDL (2002) contains 12 acceptable P concentrations ranging from 10 –54 ppb with the median being 14ppb. Those lake segments that are above 14 ppb exhibit eutrophication in varying degrees.

Based on these comparisons, it is clear that DEP's proposed total phosphorus limits exceed regional norms. CLF recommends that the phosphorus limits in Table 1 be lowered at least 5ppb for each category in order to better protect Maine's waters from eutrophication. CLF further recommends that, if the phosphorus concentration is found to be within a few ppbs either side of the applicable total phosphorus limit, the rule should mandate testing for the full range of parameters.

Environmental Response Criteria Table 2 and Table 3:

We recommend that BOD, DO and DO flux be added to these tables as environmental response criteria for lakes, as they are general health indicators and a more true measure of longer term aquatic life sustainability. All three of these parameters are helpful in rounding out general knowledge of water quality and are necessary predictive tools when combined with the listed

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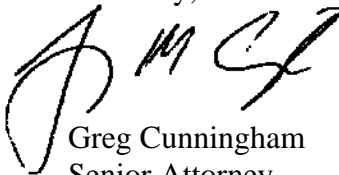
parameters. DO flux measurements will aid in assessing how daily fluctuations in DO will influence aquatic life and what kind of stresses the flux places on the existing flora and fauna. It is also valuable to understand daily flux when a discharge is proposed that would influence the daytime DO levels, and possibly create a DO deprived 24 hr daily period. BOD should be an available parameter for lakes and ponds, as there may be known discharges or activity that may alter the oxygen dynamic. It is also useful after storms to determine how varying levels of storms influence overall water quality. BOD is a good predictive tool that, when considered in conjunction with other parameters, is very effective in impairment analyses.

The term “single value,” as used in Table 3, needs clarification. It is not clear whether the “single value” is a concentration anywhere within the measured water column or is it a single averaged value for the entire water column?

In its nutrient guidance document, *Description of Nutrient Criteria for Fresh Waters (Chapter 583)*, DEP indicates that nitrogen, like phosphorus, can limit the growth of algae and plants and is therefore also an indicator of nutrient enrichment. The U.S. Environmental Protection Agency, has expressed the importance of monitoring *both* phosphorus and nitrogen and urged that states adopt standards or parameters for both. *See* May 27, 2007 Memorandum of B.H. Grumbles, Nutrient Pollution and Numeric Water Quality Standards. CLF recommends that total nitrogen (TN) should be added to the environmental response criteria contained in Tables 2 and 3 for all waterbody types because: 1) it may influence eutrophication, 2) it is a conservative contaminant that is a dependable indicator of septic system and treatment plant discharges, agricultural and stormwater discharge, and 3) some of the waterbodies being regulated are used as sources of water supply and excessive TN can include nitrate in concentrations that represent acute single exposure public health risks.

Thank you for taking these comments into consideration in finalizing and revising this draft rule. I hope that you will feel free to contact me should you have any questions.

Sincerely,



Greg Cunningham
Senior Attorney