

Penobscot Indian Nation Nutrient Criteria Testimony
June 18, 2009

My name is Angie Reed and I work for the Penobscot Indian Nation (PIN) as their Water Resources Planner. I am here to represent the Nation's Water Resources Program and share with you our perspective on the proposed nutrient criteria. Maine Department of Environmental Protection (DEP) is a colleague in this work. We have worked closely with DEP staff on many special projects and for nearly 20 years have had a cooperative agreement to provide our water quality monitoring data to them for use in Maine's 305 (b) Water Quality Assessment report to Congress. We are in favor of them enacting water quality standards for nutrients in freshwater environments and any associated environmental response limitations. But we also believe that the current rule needs improvements and clarification in order to be protective of water quality on the Penobscot River and to prevent the problems that have been reoccurring.

After more than 10,000 years the Penobscot people continue to proudly share the name of the river that is at the center of their culture. The Penobscot names of many waterways are still commonly used by all Maine residents. The Penobscot Indian Reservation includes all islands in the Penobscot River and its branches, north of, and including Indian Island. Important burial and ceremonial sites are located upon these islands, which are generally forested and low-lying, with extensive floodplains and forested wetlands. Traditional activities take place on and around the islands including hunting, fishing, trapping, gathering, boating, camping, sweat lodges and other ceremonies. Tribal members enjoy legal sustenance fishing rights that have been protected through treaties with Massachusetts and Maine. The floodplains support an annual household and commercial harvest of fiddlehead ferns. Indian Island, near Old Town, is the primary residence and the seat of tribal government for the Nation. PIN is one of three governments (tribal, federal and state) with management authority on the Penobscot River. Because Indian Island is located in the downstream portion of the watershed (Figure 1) the Penobscot Nation is affected by the cumulative impacts of the many sources of pollution upstream.

The Nation's Water Resources Program exists to protect the health of the Penobscot River which, in turn, helps to protect the health of community members using the river and their right to do so. Even though worse conditions may have been seen on other rivers in the state, our primary focus remains with the Penobscot and the center of culture and tribal health it sustains. We have seen the growth of algae during the summers increase in severity over the past 15 years, resulting in concentrations high enough to be considered a bloom. Since the first extreme bloom in 2001 and during those that happened in 2004 and 2007 we have been raising this as an issue with DEP.

At the same time the severity of the blooms increased there was also a shift in the types of algae present, starting with species that were brown and green and moving toward a dominance of blue-greens. These blue-greens, or technically called cyanobacteria, are capable of producing toxins similar to those found during the "red-tides" that shut down shellfish beds. As DEP describes in their description of the proposed nutrient criteria, the toxins that these cyanobacteria produce "damage livers and nervous systems of many animals, including people." What they didn't mention is that, in addition, these toxins can be and have been fatal to non-humans.

The World Health Organization (WHO) suggests that if there are 10 micrograms/liter or more of chlorophyll a, with a dominance of cyanobacteria, there should be risk advisories posted on site¹. As you can see on Figure 2, the summer of 2007 saw values in Dolby Pond (Figure 1) well above 10 micrograms/liter. In addition, the samples that PIN collected and paid to have identified were dominated (88.8% of all cells counted) by potentially toxigenic cyanobacteria. We posted health advisories in many locations where Penobscot community members used the river and sent out a special notice. No advisories were posted for non-Native people.

Furthermore, each of the chlorophyll a values on Figure 2 represent an average over a range of depths that get integrated in the sample. They do NOT assess the levels at the surface when this bloom was forming scums.

- On 8/16/07 in the Weldon Dam impoundment an integrated sample produced a chlorophyll a concentration of 23 micrograms/liter.
- On 8/17/07 a sample taken in the surface scum on the shore near the Weldon dam impoundment (the more likely place for people to become exposed) produced a chlorophyll a concentration of 77 micrograms/liter.

The WHO clearly states that “scums may increase local cell density and thus toxin concentration by a factor of 1,000 or more in a few hours, thus rapidly changing the risk from moderate to high for bathers and others involved in body-contact water sports.” WHO also states that “cyanobacterial scum formation presents a unique problem for routine monitoring carried out at the usual time intervals of one or two weeks, because such monitoring intervals are unlikely to detect hazardous maxima.”

The 2007 bloom was not even as severe as the ones we experienced in 2004 or 2001. By late August 2004 the afternoons on Indian Island were permeated by the intensely musty smell of cyanobacteria surrounding it. Thus, even if people could avoid the more hazardous scums, these blooms make the river much less desirable to use at all. These blooms are typically in full swing at exactly the time Penobscot Nation holds their annual Community Days on Indian Island. This three-day tribal wide gathering of families and friends has several cultural activities involving the river, including activities involving direct contact, a triathlon, fishing contest, and canoe race. In 2007 one member and his father went fishing on the Olamon Island/Sugar Island section of the river and found the bloom very apparent and the fishing lousy. Although they had originally planned to spend another day on the river they changed their minds. Additionally at this time we received numerous phone calls and reports from tribal and non-tribal public voicing concern about the bloom.

The 2001, 2004 and 2007 blooms in the Penobscot were all the result of one direct source of phosphorus discharge 75 miles upriver from where it eventually reached. This fact makes it obvious to us that previous voluntary approach efforts by DEP to resolve this problem did not work. Consequently, we feel that an appropriate version of nutrient criteria **MUST** be adopted, monitored for and enforced. Penobscot Nation has the following major issues with the nutrient criteria as proposed:

- A. Instream total phosphorus criteria will not protect water quality in the Penobscot river and will allow cyanobacteria blooms to continue. Under the current version of the nutrient criteria being proposed, the conditions described numerically and visually in

¹ http://www.who.int/water_sanitation_health/resourcesquality/toxycyanchap5.pdf

Figure 2 would have resulted in a determination of “3. Impaired. Indeterminate cause.” If the Millinocket mill was not seen by DEP as the cause of the problem (as indicated by DEP issuing them a Notice of Violation) and forced to reduce their phosphorus discharge the intensity of the 2007 bloom could have been even worse.

- B. The “Percent of Substrate Covered by Algal Growth” and “Diatom Total Phosphorus Index” are not going to be useful indicators of impairment in a large river like the Penobscot. Deep water and swift current will make it impossible to sample in those locations. We do not feel that shoreline samples will be representative enough to adequately characterize a large river.

Penobscot Nation also has many specific questions that we would like to see addressed and answered:

1. Will the new rules supersede any prior rulings made to reduce phosphorus discharges in the Penobscot?
2. What is the specific monitoring schedule that will ensure that these criteria are being met?
3. Will DEP be working with Penobscot Nation on monitoring efforts?
4. Because there are no good methods to assess long-term phosphorus concentrations in large rivers, are there plans for monitoring nutrients with in-situ continuous monitoring equipment in areas where there are known threats?
5. How are the spatial means calculated for chlorophyll a values in impounded areas? And would it be appropriate to include measurements from Dolby Pond in this calculation?
6. Why does this rule not at all distinguish between blooms that are completely, or at least predominantly, comprised of cyanobacteria and those that are not?
7. Will DEP ever treat cyanobacteria blooms with stricter regulations in this rule?
8. What is the mechanism for alerting a public health official when there are cyanobacteria blooms as significant as the Penobscot River and people experienced in 2001, 2004 and 2007?
9. What are other states doing regarding the presence of cyanobacteria blooms in rivers and notifying the public about them?
10. Has there been any sampling done to assess, concurrently, phosphorus and chlorophyll a concentrations in streams and rivers from each water quality classification? If so, what does this tell us about instream phosphorus concentrations, their pattern over a summer, and the concomitant chlorophyll a concentrations?

We thank you for the opportunity to participate in this forum and provide our comments. We will be providing written comments prior to the deadline. We hope that you will consider all of this information in your deliberation of this rule.

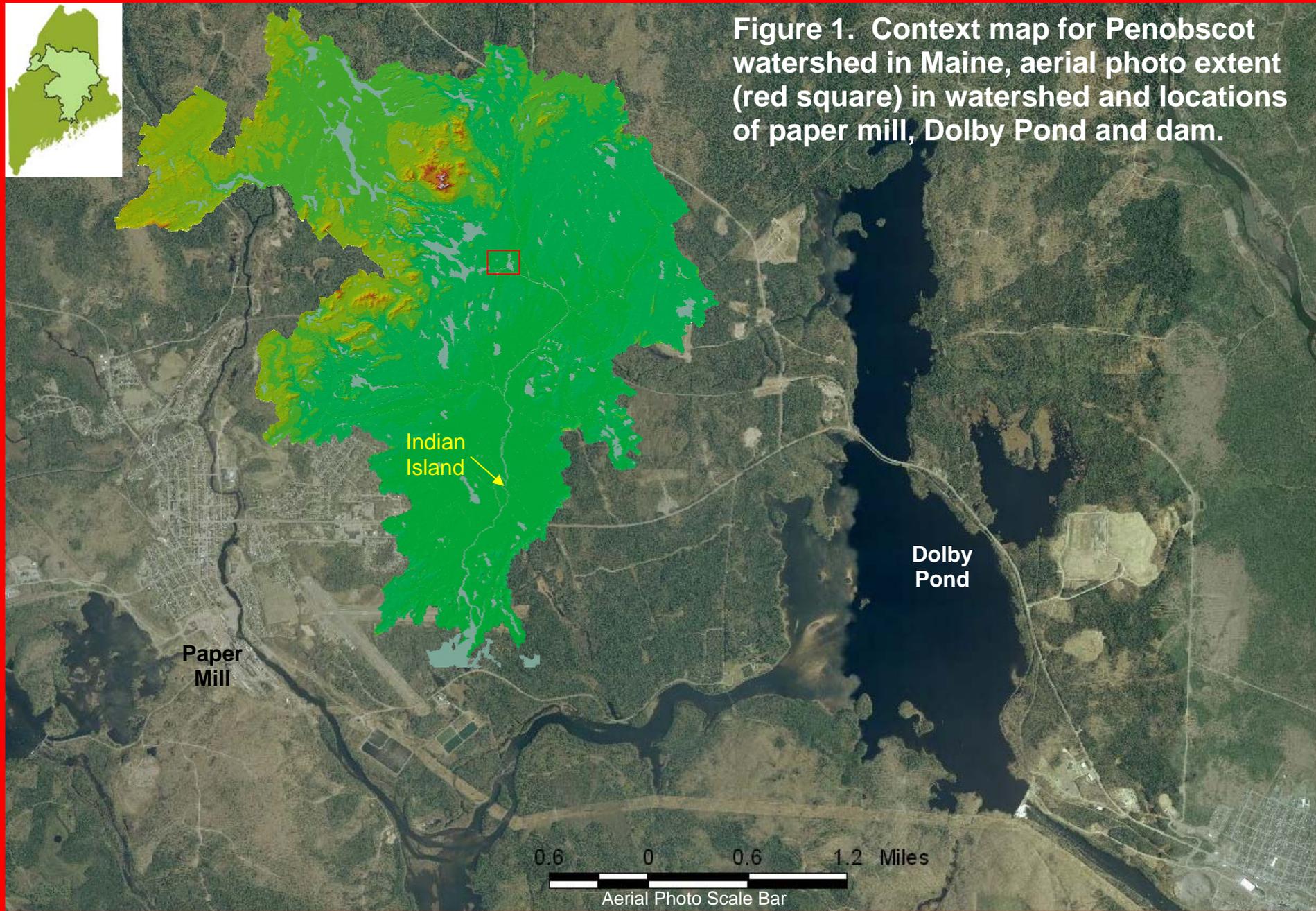


Figure 1. Context map for Penobscot watershed in Maine, aerial photo extent (red square) in watershed and locations of paper mill, Dolby Pond and dam.

Figure 2: Summer 2007 Cyanobacteria bloom in nearly 75 miles of Penobscot River

Sources of nutrients

<p>[Total P] discharged from Katahdin Paper Millinocket Mill (June - August)</p> <p>Average: 1900 PPB Minimum: 1700 PPB Maximum: 2100 PPB</p>	<p>→ Lead to</p>	<p>Instream [Total P] at Dolby Dam: from 3-day DEP wasteload study results (7/31,8/1 and 8/2)</p> <p>Average: 23.3 PPB Minimum: 22 PPB Maximum: 23 PPB</p>	<p>=</p>
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Environmental Responses

Instream [chl a] at Dolby Dam: from 3-day DEP wasteload study results (7/31,8/1 and 8/2)

Average: 24.7 PPB
Minimum: 15 PPB
Maximum: 32 PPB



Dolby Pond

Secchi depth reading at Dolby Dam on 8/9

2.66 m

88.8% of 105,722 cells/ml were potentially toxigenic cyanobacteria



E. & W. Branch Confluence



Mattawamkeag Confluence

Katahdin Paper was issued a Notice of Violation from DEP stating that “the Department believes the primary cause of these problems is excess phosphorus discharges.”

UNDER CURRENT PROPOSAL:
 These conditions would be considered

3. Impaired.
Indeterminate cause.