



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square
BOSTON, MA 02109-3912

March 18, 2010

Ms. Traci Iott
Connecticut Department of Environmental Protection
Bureau of Water Protection and Land Reuse
79 Elm Street
Hartford, CT 06106-5127

RE: Proposed Revisions to the Water Quality Standards

Dear Ms. Iott,

The Environmental Protection Agency (EPA) has reviewed the proposed water quality standards (WQS) revisions that were published by the Connecticut Department of Environmental Protection (DEP) on December 22, 2009. This letter is to provide written comments regarding the proposed revisions. They are intended to assist DEP in finalizing WQS revisions consistent with the federal Clean Water Act (CWA).

I would like to compliment DEP on several of its proposed revisions, such as generally updating the State's numeric water quality criteria for toxic pollutants, expanding the narrative biological condition gradient, and developing temperature criteria for warm, cool, and cold water fisheries.

The following comments are in subject area categories (comments on language that did not change, general comments, dissolved oxygen, nutrients, toxic pollutants, biological condition criteria, temperature, zone of influence, and antidegradation implementation policy) and include significant concerns, suggested edits and identification of additional information necessary to determine if a proposed revision is consistent with the CWA.

COMMENTS CONCERNING CURRENT AND PROPOSED REVISIONS TO CONNECTICUT WQS

Use of the Term "Natural"

In both the current WQS and the proposed revisions, Standard 8 is as follows:

"Water Quality Criteria do not apply to certain conditions brought about by natural causes. Natural hydrologic and geologic conditions may cause excursions from established criteria. The meaning of the word 'natural' is not limited to only those conditions which would exist in water draining from pristine land. Conditions which exist in the surface water, in part due to normal use of the land, may be considered natural, provided best management practices are used. It shall not be considered normal use of the land if excursions from established Criteria adversely impact an existing or designated use."

The use of the word "natural" in narrative criteria, for biological condition, pH, color, silt and sand deposits, taste and odor, temperature, and nutrients, make it a critical component of the WQSs. Yet the definition of the word, to include conditions which are caused by human activities and influences, undermines the ability of the criteria to describe conditions which protect the existing and designated uses. The caveat that "normal use of the land" is limited to those activities conducted using best management practices provides no assurance since the development of best management practices typically incorporates the considerations of cost and convenience and not solely the protection of uses, as required for criteria developed in compliance of 40 C.F.R. §131.2 EPA recommends that Standard 8 be revised to delete the last three sentences.

General Comment on 2009 Organizational Changes

DEP has proposed revisions to the Connecticut WQS that affect the organization of the standards, for the purposes of improving clarity, but not their intention. EPA agrees that the organizational changes are an improvement, though not a substantive revision of the WQSs.

Bacteria

The proposed WQS revisions include revisions to the water quality criteria for bacteria indicators (Appendix B of the WQS). Specifically, DEP proposes to make more stringent the fecal coliform criteria intended to protect shellfishing for direct consumption. We support this amendment.

At the same time, DEP proposes to remove specific reference to SA and SB waters and commercial harvesting, and to remove the less stringent fecal coliform criteria that currently apply to protect commercial shellfish harvesting. It is not clear from these revisions if DEP intends to protect all Class SA and Class SB shellfishing uses equally, or whether it intends to remove protection for the commercial shellfish harvesting use designated for Class SB waters. If the former, EPA recommends that this be made clear in Appendix B. If the latter, DEP must demonstrate by what criteria the Class SB commercial shellfish harvesting use will be protected to the same degree that the current criteria provide.

We encourage DEP to amend Standard 23 and footnote 2 to Appendix B. While we appreciate the importance of minimizing adverse impacts to aquatic life due to some forms of disinfection, we are concerned that the complete absence of any applicable bacteria criteria to protect primary and secondary recreational uses from October 2 through April 30 for waters affected by sewage treatment plants located north of I-95 is not sufficiently protective of recreational uses. We know, for example, that college and high school rowing occurs on the Connecticut River in the segment affected by the Hartford and Middletown sewage treatment plant discharges before April 30 and after October 1. Moreover, while Standard 23(A) requires continuous disinfection at all sewage treatment plants located south of I-95 to protect shellfish resources, Standards 23(B) and (C) do not appear to safeguard those shellfish resources from the lack of continuous disinfection at sewage treatment plants located north of I-95. At the same time, EPA recognizes that year round bacteria criteria may not be necessary in all circumstances. To ensure that each circumstance is considered on its own merits, EPA

recommends that the language in Standard 23(B) be revised to require year round bacteria criteria. To accommodate those circumstances where year round bacteria criteria are not necessary to protect uses, Standard 23(B) could be further amended to allow seasonal application of the disinfection requirement at the discretion of the Commissioner. Such seasonal application should be of sufficient length (greater than the current period) to protect existing and designated uses.

Dissolved Oxygen (DO)

DEP has proposed to revise the DO criteria for marine waters. The proposed new criteria are based on recommendations in EPA's *Ambient Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras*, EPA-822-R-00-012, dated November 2000. They are consistent with New York's marine DO criteria and would result in a single set of DO criteria for Long Island Sound. EPA supports the use of the 2000 EPA recommendations, and the intention to develop consistent criteria across Long Island Sound, provided the criteria revisions continue to protect existing and designated uses in the waters affected.

EPA's 2000 DO criteria recommendations, referenced above, were based entirely on laboratory findings which were supported, in part, by field observations. However, no field observations were available in 2000 for survival and growth of larvae that are sensitive to hypoxia. Therefore, EPA recommends that DEP also consider available scientific findings made available since 2000, especially field observations of aquatic life in Long Island Sound, in the evaluation of any new criteria for marine waters.

Nutrients

Since 1998 EPA has strongly encouraged states to adopt numeric criteria for nitrogen and phosphorus to prevent the degradation of existing and designated uses, particularly for aquatic habitat and recreational uses. Although DEP is making some progress in collecting the data necessary to develop numeric nutrient criteria, DEP has not developed a mutually agreed upon Nutrient Criteria Plan,¹ despite requests from EPA. While the lack of activity on numeric nutrient criteria development does not preclude EPA's approval of new narrative nutrient criteria, we continue to urge DEP to develop appropriate numeric criteria for both phosphorus and nitrogen.

Criteria, whether numeric or narrative, are defined in 40 CFR § 131.3(b) as "*elements of State water quality standards, expressed as constituent concentrations, levels or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect the designated use.*" By this definition, the criteria support the designated use. The use itself is not part of the criteria. In addition to criteria, State water quality standards may include general policies which may affect the implementation of criteria.

DEP has proposed revised language related to nutrients for Class AA and A, and B waters and added new language for Class B, SA and SB waters. This provision would

¹ *State Adoption of Numeric Nutrient Standards (1998-2008)*, EPA-821-F-08-007, December 2008.

supplement Standards 19 and 20, which both refer to controls on nutrient sources.² The new nutrient language would be the same for all waters and would replace the phosphorus narrative criteria for Class AA and A fresh waters. The proposed nutrient language for all waters is as follows:

The loading of nutrients, principally phosphorus and nitrogen, to any surface water body shall be limited to that contributed by natural sources including that arising from existing human sources provided sufficient limitations, controls or best management practices have been implemented to protect, maintain or restore designated uses in the water body from the effects of cultural enrichment. See Appendix G for guidance on implementation of this narrative criterion.

This language describes a general limitation on the loading of nutrients but it does not describe the characteristics or quality of the water affected by nutrients needed to support designated uses (for example, a narrative criterion specifying that waters be free from nutrients in concentrations that would cause cultural eutrophication). As written, the language appears to be an additional policy statement about DEP's approach to limiting nutrients, similar to Standards 19 and 20, rather than a narrative criterion that would be sufficient to protect designated uses.

The reference to Appendix G reinforces our view. Appendix G discusses DEP's implementation strategies for nitrogen and phosphorus. In the case of nitrogen, the document refers to the Long Island Sound (LIS) TMDL as the primary implementation strategy. That TMDL establishes nitrogen loads in order to address severe hypoxia and violations of the dissolved oxygen criteria in LIS. While EPA is of course supportive of the TMDL, we note that it neither establishes nor implements instream nitrogen criteria.

In the case of phosphorus, Appendix G refers to DEP's implementation plan that calculates loadings based on "best attainable reference conditions" based on a variety of factors. This procedure "yields a site-specific numerical value for individual water bodies that represents the maximum acceptable phosphorus loading..." Appendix G refers to DEP's Freshwater Nutrient Management Technical Support Document (TSD) and the Nutrient Reduction Strategy for Inland Waters: Phosphorus ("Strategy") for further explanation. Both of these documents contain a great deal of useful information related to existing land uses and sources of phosphorus loadings. However, they do not contain an approvable methodology for translating narrative nutrient criteria into site-specific numeric phosphorus criteria. As the Strategy explicitly acknowledges, technical and economic feasibility were considered in establishing the numeric criteria. Strategy at 1. The TSD explains that the objective of the approach is to strive to achieve the "best attainable condition," which is defined as "the expected ecological condition provided best management practices are in place for some period of time." TSD at 2. Appendix A of the water quality standards defines BMPs to be practices that reduce pollution based on, at a minimum, "technical, economic, and institutional feasibility." DEP's implementation plan is, in essence, a BMP-based strategy rather than a strategy that

² It would be also be interpreted in light of Standard 8, which provides that "normal" uses of the land may be considered "natural" as long best management practices (BMP) are applied. BMPs are defined as practices that reduce pollution based on, at a minimum, technical, economic, and institutional feasibility.

ensures that instream designated and existing uses are protected. There is no doubt that implementation of the plan will result in phosphorus loading reductions. But because the criteria are calculated based on the sum of the “post-BMP implementation export loads,” and those loads are determined by what is deemed to be technologically and economically feasible, there is not sufficient correlation between the criteria established by DEP’s methodology and the criteria that are needed to ensure protection of uses.

In order to be approvable, a state criterion must be shown to be “sufficient to protect the designated uses.” 40 C.F.R. § 131.6(c). Criteria “must be based on sound scientific rationale,” and where there are multiple designated uses, the criteria must support the most sensitive use. 40 C.F.R. § 131.11(a). The proposed nutrient provisions, as interpreted and implemented through the Strategy, rely in part on factors that are not relevant to the protection of uses (economic and technological feasibility) and there has been no demonstration that the criteria would protect designated uses.

Toxic Pollutants

DEP has made substantial revisions to the criteria for chemical constituents in Appendix D of the WQS. EPA is continuing to review these, and we will convey any comments we have at a later date. On the *Technical Supporting Information for Proposed Revisions to the Connecticut Water Quality Standards: Ambient Water Quality Criteria*, dated January 10, 2010, EPA has the following questions:

- Pg.4. It is stated that, “These calculations take into account which groups of people could be exposed to the contamination including *sensitive populations* ...” How are sensitive populations defined and how do the calculations take them into account?
- Pg.6. Fish consumption rates. With respect to the Balcom Report, the document states, “The study predominantly focused on consumption of marine fish, but did provide information on freshwater fish consumption also.” What freshwater consumption rates does the Balcom Report support?

Biological Condition Criteria (BCG)

The proposed narrative biocriteria will provide a useful tool for water quality protection in Connecticut. The proposed structure will be amenable to future quantification in terms of numeric biocriteria, and implementation in terms of multiple biological assemblages (e.g., macroinvertebrates, fish, and algae).

As discussed earlier in this letter, the definition of “natural” provided in Standard 8 appears contrary to the intention of the BCG to identify a “common pattern of biological responses to human disturbances.”³ If the highest tier of the BCG, proposed to be “Natural or Native Condition,” may already be subject to human use of the land, best management practices notwithstanding, there would be no consistent control condition by which to measure the impacts on biota of further human disturbances.

³ Connecticut DEP, *Technical Supporting Information for Proposed Revisions to the Connecticut Water Quality Standards: Biological Condition Gradient*, January 11, 2010.

Temperature

The proposed revisions contain new temperature requirements for cold, cool, and warm water aquatic habitats. Technical supporting information for the proposed revisions is contained in Appendix F.

Overall EPA supports DEP's new approach to temperature requirements which establishes three major classes of fish based on thermal tolerance and sets temperature requirements for each class. Recent literature supports broadening classes from warm and cold to include at least a cool water class. Some researchers (Lyons et al., 2009 cited in Appendix F) advocate dividing the cool water class into cold transitional and warm transitional to better reflect the fact that the cool water class may have more than one fish assemblage. We have the following specific comments.

EPA believes that the criteria should protect the most sensitive species within a group that are found at a location where the criteria would be applied. The proposed criteria use a different approach by using a calculated geometric mean value for all of the listed fish species per group. The use of a mean value of all listed species in a particular group does not adequately protect those species which require a lower maximum temperature. EPA recommends selecting the temperature identified as being protective for the most temperature-sensitive species within each group in order to protect all species with that group.

It is not clear that the most sensitive life stage is protected, or listed for all of the species in Tables 1-3. In addition to identifying the most temperature-sensitive species of each group, EPA recommends that DEP identify the temperature requirements of each life stage of that species, and the time period when they are likely to be present.

The column headings in tables 1, 2, and 3 do not, in all cases, clearly relate to the sub-headings beneath them. Specifically, the headings "Maximum Weekly Average Temperature Spawning" and "Maximum Temperature Embryo Survival" relate to the "Fall" season for only a couple fall spawners, such as brook and brown trout. Most species listed in these tables spawn in the spring, or early summer. EPA recommends that DEP correct Tables 1, 2 and 3.

EPA believes that at least two species listed as Warm Water should be included in the Cool Water class. These include yellow perch and alewife. Temperature requirements of these species during their various life stages support a cool water classification. In addition to alewife, other anadromous species, such as American shad should be classified as cool water species, as well. These species return from the sea to spawn, and are present in their early life stages when they are most sensitive to elevated temperatures. EPA recommends that yellow perch and alewife be removed from the warm water classification and added to the cool water classification, and that American shad also be added to the cool water classification.

Zone of Influence

The draft WQS revisions include a revision of Standard 10 which addresses a Zone of Influence (ZOI) that appears to be Connecticut's mixing zone provision. The revision adds a limit to the size of the ZOI by specifying a maximum dilution factor of 100:1 for any ZOI for any discharge. Two sentences later, in current language, Standard 10 states

that, "The zone of influence for assimilation of a thermal discharge shall be limited to the maximum extent possible." EPA recommends that the word "thermal" be stricken from this sentence to ensure that the ZOI is minimized for all discharges, regardless of the maximum allowable dilution factor.

Anti-degradation Implementation Policy

EPA is pleased that the DEP is proposing to restructure and update Connecticut's antidegradation implementation policy. We have identified the following concerns with the language proposed in the body of the standards and in Appendix E.

- Appendix E Part I: In the last sentence, please insert the words "and the level of water quality necessary to protect those uses" before the words "in all cases." This additional language is necessary to be consistent with 40 C.F.R. § 131.12(a)(1).
- Appendix E Part II and Part III: EPA's antidegradation regulation does not apply solely to new or increased discharges or activities. The applicability section and the general provisions should be clear that the antidegradation policy applies to all discharges or activities, not just new or increased discharges or activities. The manner in which it applies differs depending on whether the discharge/activity is existing or new/increased. The requirement to protect and maintain existing uses ("Tier 1") applies to *all* discharges/activities. The requirements to protect high quality waters from degradation ("Tier 2") and to protect outstanding national resource waters ("Tier 3") focus on new or increased discharges/activities because they, rather than existing discharges, have the potential to degrade waters compared to existing water quality.
- Appendix E Part II.2: We recommend that the criteria in paragraph 2 be revised to ensure that increased discharges or activities that affect the biological and physical condition of a water body are considered. DEP's draft language in this paragraph appears to exclude increases that result in degradation of water quality due to reasons other than pollutants, such as adverse alterations of flow conditions due to increased impacts from a dam's revised operations, a new dam, or adverse impacts to the biological community due to increased flow through an intake structure for a power plant.
- Appendix E Part IV: As noted above, Tier I should explicitly apply to existing discharges and activities as well as new and increased discharges/activities. In addition, in Part IV.(n), the evaluation of the effects of the proposed activity on downstream waters should occur regardless of whether the downstream water has been identified as impaired.
- Appendix E Part V.1: We have several concerns about this section.
 - We recommend that all new or increased discharges or activities be subjected to Tier 2 antidegradation review. If DEP determines that it is important to provide limited exceptions to full review, such exceptions should relate to clearly insignificant discharges and should be narrowly and precisely defined in the implementation procedures. For example, exceptions for discharges that are short term and temporary or related to a specific storm water design criteria should be quantified and procedures provided as to how an applicant may demonstrate that

these criteria have been met. DEP must provide scientific justification to demonstrate that such exceptions would not, either individually *or cumulatively*, result in the degradation of water quality.

- Notwithstanding our recommendation that Part V.1 be rewritten to focus on limited, nonsignificant exceptions (if any) to antidegradation review, we have several comments on the currently proposed language. First, it appears that the Commissioner may consider a discharge or activity to be significant (and therefore subject to full review) *only* in the specific circumstances identified in V.1.(a) through (h).⁴ As written, the provision appears to preclude the Commissioner from determining, on a case-by-case basis, that any other type of a new discharge or activity would have a significant effect on water quality. If that is the intent, then this provision does not adequately provide a mechanism for ensuring that significant lowering of water quality does not occur in the absence of a full Tier 2 review. If this is not the intent, we recommend changing the last sentence in paragraph V.1. to read “The Commissioner ... high quality waters *including but not limited to discharges or activities which he determines: ...*” Second, Part V.1. appears to provide the discretion to the Commissioner to decline to deem a discharge or activity to result in a significant change in water quality even if it falls within the circumstances identified in (a) through (g). It is difficult to imagine any discharge or activity that falls within (a) through (g) that would not result in a significant change in water quality. Finally, there is no provision that ensures that the cumulative effect of new or increased discharges or activities would not cause a significant lowering of water quality.
- Appendix E Part V.2.: Similar to the addition made in Standard 2, DEP needs to add, after the words “economic and social development,” the words “in the area in which the waters are located,” in order to be consistent with 40 C.F.R. § 131.12(a)(2).
- Appendix E Part V.4.: EPA’s regulations allow degradation upon a determination that lowering water quality is necessary to accommodate *important* economic or social development in the area in which such waters are located. DEP’s antidegradation provisions in this section, in Standard 2, and in several additional sections, refer to “overriding” rather than “important” economic or social development. It is unclear whether the term “overriding” is as protective as “important.” The question arises because, of the factors identified in Part V.4 to be considered in determining whether the project would provide overriding economic or social benefit, several of them relate to the environmental resources that would be affected by the project (specifically, Part V.4.(i), (ii) and (iv)). The inclusion of these factors suggests that the term “overriding” is applied in a way that compares the benefits of a project to the impacts from the project, and if the former “override” the latter, then this part of the test would be satisfied. In contrast, EPA’s regulation calls for an objective determination of whether the project is actually “important” for the area in which the waters are located, apart from the degree of impacts. Under DEP’s

⁴ We assume that any one of these, rather than all of them, may result in a significance determination, although the “and” at the end of subsection (g) suggests they should all be present.

formulation, it may be that a project would have "overriding" benefits without necessarily being "important." We request further explanation from DEP as to how it interprets and applies the term "overriding" in its antidegradation reviews to ensure that it is at least as stringent as the term "important."

- Appendix E Part VI(ii): The words "short term and" should be added before the word "temporary" in lines two and three, in order to be consistent with EPA's interpretation of the circumstances under which new discharges or activities may be added to an ONRW.

EPA is committed to working with Connecticut to address these comments and finalize amendments for adoption into its WQS. Please contact me or Ellen Weitzler (617-918-1582) of my staff, if you have any questions.

Thank you for the opportunity to comment on the proposed amendments to Connecticut's WQS.

Sincerely,



Stephen J. Silva, Chief
Water Quality Branch

cc. Lynne Hamjian, EPA
Mary Garren, EPA
Ann Williams, EPA

