UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

February 24, 2011

Amey W. Marrella, Commissioner
Connecticut Department of Environmental Protection
79 Elm Street
Hartford, CT 06105-5127

Re: Review and Action on Water Quality Standards Submissions

Dear Ms. Marrella:

By letter of January 4, 2011, the Connecticut Department of Environmental Protection ("DEP") submitted revisions to its 2002 Water Quality Standards ("WQS") to Region I of the Environmental Protection Agency ("Region" or "EPA") for review. The revisions were certified by the DEP Legal Director on January 4, 2011 as having been duly adopted pursuant to state law.[1] DEP subsequently submitted several changes to the January 4, 2011 revisions, by letter dated February 23, 2011, which address concerns the Region raised regarding obstacles to approval of some of the revisions and correct typographical errors. The Region has completed its review of the revisions, as amended by the submittal of February 23, 2011, along with the Hearing Officer's Report and responses to public comments. The results of that review are described below.

I commend DEP for adopting many revisions to its water quality standards that strengthen the ability to protect Connecticut's waters, such as updating the State's numeric water quality criteria for chemical constituents; adopting numeric criteria for aluminum, chloride, and 2,4-dichlorophenol; expanding the narrative biological condition gradient; adopting new and revised narrative nutrient criteria; and adopting antidegradation implementation procedures.

The Region's review of DEP's WQS submissions was limited to the provisions that are new or revised compared to the 2002 WQS, consistent with the authority provided in Section 303(c)(3) of the Clean Water Act ("CWA").[2] Pursuant to Section 303(c)(3) of

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[1] Upon approval by EPA, notice of the effective date of these revisions will be published in the Connecticut Law Journal as required by Conn. Gen. Stat.§ 22a-426(c).

[2] Some of the amendments submitted on February 23, 2011 resulted in a return to the previous (2002) WQS provisions. The Region does not consider these resulting provisions to be new or revised and therefore the Region is not acting on them. These provisions include descriptions of the mesotrophic and eutrophic categories in table 1 of the lake trophic categories; the definitions of "point source" and "surface water"; and the description of the shellfishing designated use for Class SA waters in Appendix B.

the CWA and 40 C.F.R. Part 131, I hereby approve the following surface water quality standards revisions[3]:

Designation of Uses (40 C.F.R. § 131.10)

Removal of Dual Annotation of Classifications

- Deletion of Standards 31, 9(C), and 9(D), and revisions to the classification maps which result in the classifications being descriptors solely of designated uses; and
- Revisions to the definition of "Classification" in Appendix A of the WQS, clarifying that classifications are categories only of designated uses (and not of existing water quality)

Numeric Criteria (40 C.F.R. § 131.11)

Chemical Constituents[4]

- Adoption of numeric criteria for the protection of freshwater aquatic life for acrolein, chloride, and aluminum, as listed in Attachment A of this letter, consistent with EPA's National Recommended Water Quality Criteria ("NRWQC");
- Update of numeric criteria for cadmium for the protection of freshwater and saltwater aquatic life, as listed in Attachment A, consistent with EPA's NRWQC;
- Update of the numeric criterion for silver for the protection of saltwater aquatic life, as listed in Attachment A, consistent with EPA's NRWQC;
- Update of the numeric criteria for arsenic, cyanide, mercury and selenium to apply to the total form of each of these inorganics, as listed in Attachment A, consistent with EPA's NRWQC;
- Adoption of numeric criteria for 2,4-dichlorophenol for the protection of human health, as listed in Attachment A, consistent with EPA's NRWQC; and
- Update of numeric criteria for the protection of human health for 82 chemical constituents, as listed in Attachment A, consistent with EPA's NRWQC;

Site-Specific Copper Criteria[5]

- Adoption of site-specific copper criteria for the Pootatuck River, from the Newtown POTW to the confluence with the Housatonic River

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[3] DEP's January 4, 2011 submission contained ground water quality standards as well as surface water quality standards. Ground water quality standards ("GWQS") are not within EPA's scope of review and approval authority under section 303(c) of the CWA and therefore we are taking no action on the GWQS.

[4] The Region is not acting on the new formaldehyde criteria contained in the January 4, 2011 revisions because DEP withdrew those revisions by its February 23 submittal. The Region is not acting on the revised beryllium criterion for fish consumption contained in the January 4, 2011 revisions because it was a typographical error and was corrected back to the 2002 criterion in DEP's February 23 submittal.

[5] The Region is not acting on the application of site-specific copper criteria to a segment of Indian Lake Creek (Appendix D, footnote 10), because DEP withdrew those revisions by its February 23 submittal.

Fecal Coliform

- Revision in Appendix B of the 90% fecal coliform criterion for protection of shellfishing uses in Class SA waters; and
- Revision in Appendix B of the shellfishing designated use for Class SB waters from "Commercial Harvesting" to "Indirect Consumption."

Dissolved Oxygen

- Revisions of dissolved oxygen criteria for Class SA and SB waters in Appendix C

Lake Trophic Categories

- Addition of macrophyte coverage as a defining criterion, along with water column parameters, for assessments of trophic states

Narrative Criteria (40 C.F.R. § 131.11)

Natural Causes

- Revisions to Standard 8 that narrow the scope of what is considered to be natural causes or conditions; and
- Addition of the definition of "Natural" to Appendix A

Biological Condition Gradient

- Revisions to Standard 16 replacing "Benthic Invertebrate" with "Biological Condition" and removal of the second sentence to broaden the use of biological indicators in the assessment of the biological integrity of Connecticut's surface waters;
- Replacement of the narrative "Benthic Invertebrate" criteria for Class AA, A, and B waters with broader narrative criteria for "Biological Condition," and adoption of the corresponding Biological Condition Gradient Model provided in a new Appendix F;
- Addition of narrative criteria for "Biological Condition" for Class SA and SB water bodies; and
- Addition of definitions for "Biological Condition Gradient Model," "Biotic Community (Aquatic)," "Biotic Community Structure," "Ecosystem Function," "Sensitive-rare Taxa," " Sensitive-ubiquitous Taxa," "Significant Natural Communities," "Special Concern Species," "Trophic State," and "Tolerant Taxa" to the list of definitions in Appendix A

Nutrients

- Revisions to narrative nutrient criteria for Class AA and Class A waters to clarify protection of designated uses; and
- Addition of narrative nutrient criteria for Class B, SA, and SB waters

Antidegradation (40 C.F.R. § 131.12)

- Revisions to Standard 3 to clarify that, in the evaluation of a proposed lowering of water quality, both local and statewide social or economic benefits must be considered;
- Revisions to Standard 4 to clarify expectations for discharges and activities in high quality waters;
- Revisions to Appendix E, Connecticut Antidegradation Implementation Policy;
- Revisions to Standard 19 to broaden the requirement for use of best management practices to control phosphorus and nitrogen pollution to include sources which have the potential to cause impairment even if such impairment has not yet occurred, consistent with the federal requirement to maintain and protect water quality (40 C.F.R. § 131.12(2)); and
- Revisions to the definitions of "Antidegradation Policy," "High Quality Waters," and a new definition of "Outstanding National Resource Waters" in Appendix A

General Policies (40 C.F.R. § 131.13)

Zone of Influence

- Revision to Standard 10 requiring that a zone of influence be limited to the extent practicable for all discharges (not just thermal discharges) and related change to the definition of "Zone of Influence" in Appendix A;

Minimum Flow

- Revisions to Standard 11 removing the exception to the application of the WQS to 7Q10 minimum flow if the surface water was, but is no longer, regulated by dams or water withdrawals sanctioned by law to result in flows below that level; and
- Revisions to Standard 11 requiring that tidal water bodies be evaluated under low tide conditions unless another low flow regime is demonstrated to the DEP Commissioner's satisfaction to be protective of water quality and aquatic resources

Also pursuant to Section 303(c)(3) of the CWA and 40 C.F.R. Part 131, I am hereby approving all additional revisions of the water quality standards contained in the January 4, 2011 submittal, as modified by the February 23, 2011 submittal. While the revisions approved in this group are also important, they are generally more "housekeeping" in nature, or clarifications, or administrative changes related to implementation. Such revisions include, for example, language changes in the Preface and Introduction which explain the Connecticut WQS; revision to Standard 2 clarifying that water quality (not just water) necessary to support uses must be maintained and protected; revisions to Standard 21 to be consistent with state practice in the identification and designation of Class AA surface waters; expanded use of abbreviations (such as "WQS" for "Water Quality Standards"); additions of definitions for "Endangered Species," "Native," and "Threatened Species"; revisions to the definitions of "Indicator" and "Indicator

Bacteria"; removal of definitions which are not used in the WQS; and formatting and organizational changes.

Supporting Discussion of Approvals

Designation of Uses (40 C.F.R. § 131.10)

Removal of Dual Annotation of Classifications

The removal of dual annotation of classifications for water bodies is an improvement in the WQS in that it results in a clearer identification of what the designated uses are for each water body. In the new nomenclature, waterbody classification no longer includes the identification of the water quality currently attained in that waterbody. The designated uses, whether the water quality to support those uses is attained or not, are now the sole classification indicated for each water body. Water body attainment data will continue to be available in the Connecticut Integrated Water Quality Reports published every two years. EPA finds that this change in annotation methodology is an improved method for specifying designated uses to be achieved and protected, as required by 40 C.F.R. § 131.10(a), and approves the revisions identified above that relate to this change on that basis.

Numeric Criteria (40 C.F.R. § 131.11)

Chemical Constituents

EPA's approval of DEP's revisions to its numeric criteria for chemical constituents in Appendix D (with the exception of the site-specific copper revisions discussed below) is based on a review of whether the criteria protect the applicable designated uses, including a consideration of EPA's National Recommended Water Quality Criteria published pursuant to Section 304(a) of the CWA. EPA finds that the newly adopted and revised criteria are at least as protective as the EPA recommended criteria in all cases, and are protective of designated uses for the reasons explained in the EPA criteria documents for each chemical constituent.[6]

Site-Specific Copper Criteria

On October 20, 1997, EPA approved Connecticut's adoption of site-specific copper criteria for 16 water bodies, based on the supporting documentation DEP submitted by letters of April 12, 1996 and May 28, 1997, including "Derivation of Site-Specific Dissolved Copper Criteria for Selected Freshwater Streams in Connecticut." DEP's analysis indicated that criteria based on the reference site Water Effects Ratios ("WERs") were expected to provide conservative protection of designated aquatic life uses when applied to waters where the instream waste concentration ("IWC") of treated sewage effluent is 20% or greater under critical low flow (7Q10) conditions.

Connecticut's 2011 revisions include the adoption of site-specific copper criteria for the Pootatuck River, from the Newtown publically owned treatment works ("POTW") to the confluence of the Housatonic River, on the basis that the IWC for this water body is also

[6] The National Recommended Water Quality Criteria and support documents are available at http://water.epa.gov/scitech/swguidance/waterquality/standards/current/index.cfm.

greater than 20% under critical low flow conditions. According to DEP calculations,[7] the IWC under low flow conditions for the Pootatuck River reach in question is 38%.

The new site-specific copper criteria for the specified segment of the Pootatuck River are approved on the basis that they incorporate new scientific information specific to this waterbody, maintain consistency with EPA recommendations for the development of site-specific copper criteria, and are protective of designated and existing uses.

Fecal Coliform

EPA approves the change to the fecal coliform criterion in Appendix B for Class SA waters from 90% of samples less than 43/100ml to 90% of samples less than 31/100ml (based on utilizing the mTec method, as specified by the United States Food and Drug Administration) because the new criterion is consistent with most recent (2007) recommendations from the National Shellfish Sanitation Program (NSSP) for the protection of the shellfishing designated use.

DEP changed the shellfishing designated use for Class SB waters to "Indirect Consumption" from "Commercial Harvesting." This represents a helpful clarification, since commercial harvesting also occurs in Class SA waters, and EPA approves the change on that basis.

Dissolved Oxygen

EPA's approval of DEP's revisions to its dissolved oxygen ("DO") criteria is based on a review of whether the criteria protect the applicable designated uses, including a consideration of EPA's *Ambient Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras,* EPA-822-R-00-012, dated November 2000. The revised DO criteria are based on this criteria guidance. As the Region recommended in comments on the December 2009 draft WQS revisions, DEP conducted a literature search to see if any research had been published since 2000 on the survival and growth of larvae that are sensitive to dissolved oxygen concentration, an area of limited data at the time the 2000 DO criteria were issued. DEP found no information that supported a re-evaluation of the data provided in the criteria document.[8]

During review of the final DO revisions, the Region requested clarification from DEP of the time frame over which the exposure allowance days identified in Table 1 may occur. In its February 23, 2011 submission, DEP clarified that the number of days during which an excursion will be allowed will be evaluated over a calendar year. By implementing the criteria in this manner, DEP assures that the criteria do not allow multiple chronic exposures within a short period of time.

EPA approves the revised DO criteria because they are as protective as the EPA criteria guidance for dissolved oxygen, are protective of designated uses for the reasons

[7] Calculations provided by email with attached memo of January 19, 2011 from Traci Iott, DEP to Ellen Weitzler, EPA.

[8] Ruzicka, Denise, Revisions to Connecticut Water Quality Standards Hearing Officer's Report, January 4, 2011, page 52.

explained in that guidance document, and will be implemented within protective duration boundaries.[9]

Macrophyte Criteria

The revisions include the addition of macrophyte[10] coverage as a parameter to be used to categorize lakes as oligotrophic, mesotrophic, eutrophic or highly eutrophic. This additional parameter measures the percentage of the lake that is observed to be covered by macrophytes. Prior to these revisions, the WQS included only water column trophic status indicators for lakes (total phosphorus, total nitrogen, chlorophyll-a, and secchi disk transparency), although DEP has in practice considered macrophyte coverage in lake assessment, as indicated in the 2008 Integrated Water Quality Report.[11] The purpose of the macrophyte coverage criteria is to ensure that the biological response to nutrient enrichment (due to natural or anthropogenic sources) is not under-reported in lakes where that response is characterized more by macrophyte growth than by non-plant algal blooms. The macrophyte criteria adopted into the WQS are consistent with macrophyte thresholds DEP previously used to classify 49 lakes according to trophic condition and acidification condition pursuant to Section 314 of the CWA.[12]

EPA approves of the addition of the aquatic macrophyte criteria to the lake trophic status standards on the basis that the criteria provide an additional tool to assess the attainment of designated and existing uses.

Narrative Criteria (40 C.F.R. § 131.11)

Natural Causes and Definition of "Natural"

EPA approves of the revisions to Standard 8, which eliminate "normal uses of the land" from being a basis for allowing excursions from criteria based on natural causes or conditions, and approves the addition of a definition of "natural" that refers to conditions and communities that are unaffected or minimally affected by human influences, because they strengthen the ability of the WQS to protect existing and designated uses. As discussed in EPA's March 18, 2010 comments on the December 2009 draft WQS revisions, 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 an underlying component of the WQS. The revisions in Standard 8 also remove considerations of cost and convenience from the criterion, consistent with 40 C.F.R. § 131.11, which requires criteria to be based on sound scientific rationale.

EPA's approval of revised Standard 8 is also based on the assurances provided in DEP's response to EPA's request for clarification. In its February 23, 2011 submission, DEP explained that Standard 8 applies when natural causes lead to an excursion of a criterion above that specified in the Water Quality Standards. In that case, the condition that arises

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[9] We note that while Appendix C refers to the State's Consolidated Assessment and Listing Methodology ("CALM") for information about how compliance with the criteria should be interpreted, the Region does not review the CALM pursuant to Section 303(c) of the CWA, and is not by this action approving the State's CALM and interpretations contained therein.

[10] Macrophytes are aquatic plants that are large enough to be seen without magnification.

[11] August 2008, Connecticut DEP, *2008 State of Connecticut Integrated Water Quality Report.*

[12] 1991, Connecticut DEP Bureau of Water Management, *Trophic Classifications of Forty-nine Connecticut Lakes.*

from natural causes becomes the applicable criterion. However, except for the criterion based upon natural causes, all the water quality standards unaffected by natural causes remain applicable to the water body.

Biological Condition Gradient

EPA's approval of the revisions to the WQS related to the introduction of the narrative biological condition gradient is based on their potential to increase protection of designated and existing uses. The new language broadens the consideration of biological indicators of ecological response to include assemblages beyond the macroinvertebrates currently assessed to measure aquatic life uses.

Nutrients

EPA's approval of the new narrative nutrient criteria is based on their consistency with 40 C.F.R. § 131.11(b)(2), which allows states to establish narrative criteria, and on the fact that, while lacking the specificity of numeric criteria, they are protective of designated uses.

As stated in our March 18, 2010 comments on the proposed WQS revisions, EPA continues to strongly encourage states to adopt numeric criteria for total phosphorus and total nitrogen, as the most effective approach to achieving reductions in nutrient enrichment in the long term.

Antidegradation (40 C.F.R. § 131.12 and 40 C.F.R. § 131.13)

EPA approves the revisions to the standards and definitions related to antidegradation because they strengthen Connecticut's ability to protect water quality from new sources of pollution. The antidegradation policy, set forth in Standards 2, 3, 4 and 5, meets the minimum requirements of federal regulation, as described in 40 C.F.R. § 131.12. In particular, the revisions to Standard 3, which requires that the social and economic benefits to the local area be considered in deciding whether a lowering of water quality is necessary, renders Connecticut's antidegradation policy consistent with 40 C.F.R. § 131.12(a)(2) (which requires a finding that "allowing lower water quality is necessary to accommodate important economic or social development *in the area in which the waters are located.*" [emphasis added]).

EPA approves the substantial revisions to Appendix E, Connecticut's antidegradation implementation policy (as amended by the February 23, 2011submittal), because it is consistent with Connecticut's antidegradation policy and meets EPA's current antidegradation guidance. Implementation of Connecticut's antidegradation policy using the procedures described in Appendix E will enhance Connecticut's ability to protect existing and designated uses and high quality waters. Revisions made from the December 2009 draft to the final version of Appendix E were responsive to comments from both EPA and the public. In particular, DEP has narrowly constrained the circumstances under which full Tier 2 antidegradation review would not be required, specifying only three circumstances in which the Commissioner *may* (but is not obligated to) determine that there would not be a significant lowering of water quality in high quality waters. These circumstances are narrowly and precisely defined in the implementation procedures, and it is reasonable to conclude that discharges and activities

found not to significantly lower water quality within the three specified categories would, both individually and cumulatively, maintain high quality waters.

General Policies (40 C.F.R. § 131.13)

Zone of Influence

EPA approves the revision to Standard 10, which applies the narrative requirement to limit the zones of influence for all discharges to the extent practicable, based on the increased protection this will provide to designated and existing uses and its consistency with EPA's mixing zone policies, which generally recommend the smallest mixing zone practicable. Previously this limitation only applied to thermal discharges.

Minimum Flow

The first revision to Standard 11 removes the exception to the application of the WQS to 7Q10 minimum flow for surface waters that had historically been regulated by dams or sanctioned water withdrawals. This is a reasonable revision, since surface waters that are flowing without anthropogenic flow controls should be regulated at the currently occurring low flow and not an artificial low flow that no longer occurs. EPA finds that by broadening the application of the 7Q10 minimum flow, the revision provides appropriate protection of designated and existing uses and approves the revision on that basis.

The second revision to Standard 11 adds a requirement that tidal water bodies be evaluated under low tide conditions unless another low flow regime is demonstrated to be protective of water quality and aquatic resources. Again, EPA finds that this is a reasonable revision that defines a protective, worst case low flow condition for tidal waters. Therefore, EPA approves the revision on the basis that it will provide greater protection for designated and existing uses.

EPA's approval of Connecticut's surface water quality standards revisions does not extend to waters that are within Indian territories and lands. EPA is taking no action to approve or disapprove the State's revisions with respect to those waters at this time. EPA will retain responsibility under Sections 303(c) and 303(d) of the CWA for those waters.

We look forward to continued cooperation with Connecticut in the development, review and approval of water quality standards pursuant to our responsibilities under the Clean Water Act. Please contact Ellen Weitzler (617-918-1582) if you have any questions.

Sincerely,

for

Stephen S. Perkins, Director
Office of Ecosystem Protection

Attachment

cc: Lori Nordstrom, USFWS
Mary Colligan, Protected Resources, NMFS
Peter Colosi, Habitat Conservation Division, NOAA
Thomas Chapman, USFWS

Danielle Fuligni, EPA SSB
Stephen Silva, EPA
Mary Garren, EPA
Ellen Weitzler, EPA
Ann Williams, EPA