

FEB 03 2010



Little Divide Farm



January 28, 2010

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

Dear Traci,

Enclosed are my comments regarding the Department's proposed revisions to Connecticut's Water Quality Standards. They are being transmitted to you for inclusion in the record of public comment related to the triennial review of the Standards.

Among the many comments provided I consider three topics to be of greatest concern

1. I cannot stress enough the importance of including, on the record, a comprehensive scientific justification, prepared by staff, for the procedure used to derive the toxic, temperature, and nutrient criteria. The strength and legitimacy of Connecticut's WQS rests squarely on that foundation. Connecticut has a well deserved national reputation for developing criteria based on sound, scientifically defensible principles. Science is also an iterative process. Future advancements in understanding and further evolution of the criteria is facilitated by a clear documentation regarding the current state of knowledge and analysis used to derive the criteria proposed here.
2. I am concerned that the Antidegradation Implementation Policy does not provide a clear and objective means of identifying which surface waters should be considered to be "high quality" for purposes of applying the policy. This is a critical shortcoming of the Policy and I urge you to consider that issue carefully when evaluating my comments as well as others you may receive. Without a way to determine if a specific water is high quality, there is no way to know how to apply the antidegradation policy correctly. This question must be answered.

3. I am concerned that Appendix G does not adequately describe what the phosphorus reduction strategy actually is and what the result of implementing that strategy is expected to be. I understand that there may be voluminous supporting documents but the WQS must include sufficient detail to illustrate how implementing the strategy will lead to permit limits for point discharges, encourage non point reduction, provide accountability to track progress, and ultimately be protective of designated uses. Some projections regarding the magnitude of the reductions anticipated as a result of implementation and the time frame for achieving those reductions would be highly valuable additions to the Appendix as well.

Should you wish to contact me regarding any of the issues raised, I may be reached at _____, or via email at _____ Thank you the opportunity to participate in this important process.

Sincerely,



Lee E. Dunbar

COMMENTS ON CONNECTICUT'S PROPOSED WATER QUALITY STANDARDS

Preface

Questions have been raised in the past concerning whether the Preface is actually a part of the WQS, yet this section continues to perform a useful function and should be maintained. The Preface explains how the three parts of the WQS function together (standards and policy statements, criteria established to maintain specific designated uses, and classification maps that link designated uses to specific surface waters). This section also reinforces the concept that the WQS are required and authorized by State law as well as required for consistency with federal law. My recommendation is to retain this section as written regardless of whether EPA determines it necessary to review and approve as part of the WQS submission under federal rules.

Introduction

Similar concerns have been raised with regard to the introductory paragraphs incorporated into the WQS. Similar reasoning supports retaining this section in Connecticut's WQS. The Introduction also serves to clarify the role of CT's Groundwater Standards as an integral part of Connecticut's program to protect water quality. Groundwater protection standards are not required by federal law yet clearly represent an important component necessary to support an effective, integrated approach to managing water resources. One apparent typographical error should be corrected in the first paragraph on line 6, clean should read clear within the context of that sentence.

Surface Water Quality Standards

WQS # 3 has been modified in the proposed revision to include consideration of overriding economic or social benefits to "the area in which the receiving water is located" in addition to the previous requirement that those benefits would be realized "to the State". This change strengthens this standard but only if the conjunctive "and" is retained requiring that any lowering of quality must be found necessary to accommodate overriding economic or social benefits at both the local and Statewide scale.

Many development projects are viewed at the Town level as being necessary to support the local economy (increase tax base, provide jobs, etc) that would easily meet the local benefit test yet not meet the test of providing the necessary benefits at a larger statewide scale. Many municipalities have argued that the cost of providing advanced levels of wastewater treatment represents an unacceptable economic burden on the local economy. Allowing water quality to be lowered, or not sufficiently improved to meet WQS, based exclusively on local social and economic considerations would greatly increase the potential for water quality degradation in pursuit of short-term, nonsustainable economic gains. Similarly, reliance on only the statewide benefit provision could result in lowering of localized water quality without consideration of some benefits accruing to the local community where that degradation takes place. Demonstrating statewide necessity is a

much more difficult test to meet and only those projects that provide broad-based benefits (transportation, energy, ect) could be expected to meet that criteria. By consideration of both statewide and local benefits in determining the necessity of lowering water quality this provision, as proposed, would strengthen Connecticut's WQS and should be retained.

I suggest two wording changes (addition in capitals) within the second paragraph of WQS #3, line 4. Edit to read: General Statutes, and MAY require additional treatment measures IF deemed necessary to prevent pollution and maintain high water quality. There is no logical reason to require the Commissioner to mandate additional treatment simply for treatment sake if no water quality benefits will result. If treatment is necessary, then the Commissioner clearly has an obligation to require it under the regulations governing the permit program. It should be noted that the Commissioner's authority under the federal and State regulations governing the NPDES program (responsible for authorizing discharges from point sources) is constrained by a requirement that treatment be either 1) a technology-based requirement established by regulation and applicable to all discharges of a similar type regardless of location or impact on the environment, or 2) a water quality-based requirement that is contingent upon a demonstration by the regulatory authority that the discharge will have a "reasonable potential to cause or contribute" to an exceedance of criteria to protect designated uses established in the WQS. In short, the Commissioner has no authority to impose treatment if that treatment is not "necessary" and the Commissioner's authority to impose any restrictions on a discharge derives solely from State and federal regulations governing discharge permitting which implement those portions of the WQS related to permitting discharges, not from the WQS directly.

WQS #9. In section 9(A) I suggest addition of the phrase that appears in Section 9(B), "subject to the provisions of Section 22a-430 of the CGS", at the end of the first sentence. This change is recommended for consistency between subsection A and B and to underscore the principle that discharges to both Class A and Class B waters are permitted pursuant to the permitting regulations, not the WQS.

Paragraph two of this section is clearly intended to facilitate permitting of discharges of highly treated domestic sewage to waters where such a discharge represents the only alternative currently available to mitigate an existing pollution problem. The central question regarding this change is whether allowing a discharge of treated domestic sewage to a surface water results in a loss of the designated use "potential water supply". If the answer to that question is "yes" then this provision is unnecessary since a use attainability analysis (UAA) would be necessary to remove the use prior to issuance of a permit and these requirements are, for the most part, redundant with UAA requirements. If the answer to that question is "no" then, this provision represents an enhancement of the WQS by requiring a use attainability analog as a condition of permit issuance.

The distinction between waters designated for use as a public water supply and those not so designated in Connecticut is based on statutory restrictions, established by State law, that currently prohibit discharge of domestic sewage to waters utilized for drinking water, not on any measure of actual water quality. This "administrative" prohibition artificially

limits the availability of surface waters as drinking water supplies by restricting this use in Class B waters including many that exhibit excellent water quality with regard to supporting use as a drinking water supply.

The great majority of states in the U.S. currently utilize surface waters that receive discharges of treated domestic sewage for drinking water supplies. Generally, the suitability of a surface water for use as a drinking water supply in these jurisdictions is determined by the availability of treatment technology that can insure that the water is potable following treatment. In brief, support of drinking water use is based on water quality conditions. For the Commissioner to authorize a permit to discharge treated domestic sewage to a surface water that is currently impacted by that same source therefore does not restrict the potential for that water to be used in the future as a drinking water supply provided the permit mandates treatment sufficient to restore that surface water to a quality that would support use as a drinking water supply. Statutory restrictions may be removed with the stroke of a pen while loss of use based on poor water quality is, and should remain, the focus of Connecticut's WQS.

The proposed addition to WQS#9 provides a high level of assurance that discharges of treated domestic sewage to Class A waters will be permitted only under a limited set of circumstances. Importantly, no new or increased discharges are contemplated and discharges will only be permitted to facilitate mitigation of existing pollution problems. Since it is expected that water quality will improve following issuance of a permit to mitigate an existing problem and no designated uses will be lost, performance of a UAA is not necessary and would, in fact, be counter productive since it would unnecessarily delay mitigation with no prospect of water quality enhancement. I offer the following suggestions to clarify the intent of this section.

2) insert "PRE_EXISTING" between "abate" and "ground water" to reinforce the restriction on permitting such discharges to situations where a pollution problem exists.

4) reword to read; "that any such discharge shall not BE UTILIZED TO support ANY new SOURCE or TO ACCOMMODATE ANY increase (delete "growth") IN AN EXISTING SOURCE OF POLLUTION (delete "or change in use" since it is unclear what use is being referenced – designated use of the resource or human use which is already covered by the restriction to domestic sewage). The term "growth" is also problematic since it begs the question "growth of what?"

5) change "possible" to "FEASIBLE" to avoid being obligated to require something that is possible yet patently unreasonable. Edit to read: "maximum extent FEASIBLE and IN ALL CASES to a level..." Delete "Nothing in this authorization would preclude the Commissioner from requiring" (sounds too much like permit language) and replace with "The Commissioner may require such discharge to be eliminated OR ADDITIONAL TREATMENT TO BE PROVIDED should (delete "future conditions provide") a technically AND economically feasible alternative to such discharge to a surface water with a Classification of A or SA BE DEVELOPED IN THE FUTURE.

WQS#10. This Standard addresses Connecticut's "mixing zone" policy and I have several concerns. First, the phrase "provide a maximum of 100:1 dilution ratio for any discharge" injects uncertainty when I am sure the intent is to increase clarity. Is the intent to evaluate this provision on a pollutant by pollutant basis? Is it appropriate to evaluate all pollutants (e.g. persistent bioaccumulating pollutants, pollutants for which human health is a concern following long exposure, threshold pollutants, carcinogens, nutrients, ammonia, pH, DO, temperature, acute and chronic numeric criteria, acute and chronic whole effluent toxicity) under the same hydrologic conditions (e. g. 7Q10)? Are the averaging period, duration of exposure, and frequency of exceedance concerns similar for all pollutants? What discharge flow rate, pollutant concentration or mass should be used to calculate the dilution ratio? Is it appropriate to use the same method of calculation for intermittent discharges such as storm water as is used for continuous discharges such as might originate from a sewage treatment facility? My recommendation regarding this phrase is to delete it and continue to rely on the judgment of DEP staff to provide the necessary scientific and technical support necessary to establish reasonable zones of influence. The allocation of a ZOI must be a case-by-case judgment and subject to debate during the public participation process associated with permit issuance under 22a-430 CGS.

I suggest addition of the phrase "UNDER A RANGE OF HYDROLOGIC CONDITIONS" following "...and assimilation of waste" in the fifth sentence of this standard. This change would provide additional support for ongoing staff efforts to evaluate discharges under a variety of flow conditions to insure ZOI are protective of aquatic life use.

I suggest consideration be given to deleting the "guideline" concerning allocation of 25% of cross sectional area or volume of flow for thermal discharges. This provision being simply a guideline has no real impact except to instigate debate when reasoned analysis leads to recommending a ZOI of a larger or smaller size. Again, potential difficulties may arise when permitting the thermal component of any discharge and it would be short sighted to assume that the only discharges affected would be continuous non-contact cooling. Since staff are obligated to defend the scientific rationale for any recommend ZOI anyway, I don't see how this guideline makes that job any easier or improves the outcome.

WQS#11. One minor change is suggested. Replace the phrase ""has been historically" with "IS" in the first sentence. The relevant concern to supporting aquatic life use is how flow in a surface water is currently regulated, or will be regulated during the term of the permit, not what has transpired in the past.

WQS #12. This standard would benefit from significant reorganization in presentation to enhance clarity. The following changes are suggested.

Changing "will" to "shall" in the first sentence would make this consistent with usage in other WQS. Edit (A) to read as follows:

(A) In making a determination under Chapter 446 of the C_G_S_ as to whether a discharge will or can reasonably be expected to cause pollution of surface waters, the Commissioner shall consider:

1. the numeric criteria for the toxic pollutants listed in Table 1 of Appendix D; and
2. benchmarks for toxic substances not listed in Table 1 of Appendix D that have been developed consistent with the protocols contained in Table 2 of Appendix D of the WQS in any case where the Commissioner determines consideration of such benchmarks are necessary to protect human health and the environment; and
3. additional scientific and technical information including the results of whole effluent or sediment toxicity tests, as available, for exposures and effects the Commissioner has determined are not adequately addressed through the application of the numeric criteria listed in Table 1 or benchmarks developed in accordance with Table 2 of Appendix D.

WQS#14. In the last sentence I suggest replacing “he or she” with “THE COMMISSIONER”.

WQS#16. I suggest that “THE CONNECTICUT BIOLOGICAL CONDITION GRADIENT MODEL” is a more appropriate term than “Biological Condition criteria”.

WQS#19. I suggest rewording for clarity thus:

“...impairment of any surface water shall BE REQUIRED BY THE COMMISSIONER TO apply Best Management Practices INCLUDING IMPOSITION OF discharge limitations or other reasonable controls (delete “that may be required by the Commissioner”) on a case-by-case basis as FOUND NECESSARY BY THE COMMISSIONER (delete “necessary”) to ensure maintenance and attainment....”.

Although a minor point, it may be important to reinforce the concept that BMPs include treatment technology and I believe the suggested changes are consistent with that objective.

As an aside, it may be helpful to remember that a treatment BMP is a requirement to implement a specific type of technology (e.g. a settling basin) whereas “limits” can be considered a target effluent concentration that the discharger may achieve using whatever technology they find most cost-effective (e.g. settling basin or sand filter).

WQS#21. I suggest rewording subsection (2) to read: “have been recommended for future use as a drinking water supply in AN APPROVED Water Supply Plan prepared pursuant to section 25-32d-2 of the Regulations of Connecticut State Agencies, This

change is suggested, in part, due to the observation that water supply utilities have occasionally recommended use of surface waters that DEP and/or DPH have found totally unacceptable for drinking water supply use. Reference to 25-32d-2 restricts this provision to “water companies” as it is intended as well as negating the need to define water supply plan since that task is handled in the DPH regulation.

WQS#23. Replacing the word “nature” with “CHARACTERISTICS” would be more accurate in this usage.

WQS#30. In subsection (A) the appropriate reference would be Water Quality Classifications, particularly since it is being proposed to eliminate the current condition aspects of the maps.

WQS#31. The Classification maps have historically included a “slash” classification (e.g. B/A, C/B) assigned to those waters where the current quality (first letter) is not sufficient to support all designated uses assigned to the “goal” (second letter following the slash). This construct has proven difficult to maintain and currently the adopted maps do not accurately portray existing quality. For water quality management purposes, the “existing quality” classification has little relevance since the water quality criteria that must be met are those associated with the “goal” classification. Nevertheless, the “slash” classification has proven useful in identifying the presence of legacy pollution sources (e.g. closed and capped landfills, areas of contaminated sediments). Discontinuing the “slash” designation could potentially result in a loss of useful information.

Recent advances in data management and assessment of water quality information however offer the prospect of obtaining this information in a more timely way than through the laborious process of updating the classification maps. It is highly likely that prior to the next triennial revisions to the WQS the DEP will have available updated assessments of current water quality conditions based on monitoring data for those waters where data is available and highly reliable projections of conditions at areas not monitored based on sophisticated water quality modeling. The technical feasibility of success has already been demonstrated at a regional watershed scale and all that remains is to scale up to a statewide application. The DEP should make it a priority to complete this work as soon as practicable and make this information available to staff and the public via an interactive application housed on the DEP web-site. Successful completion of this work will insure that no information is lost regarding the location of potential pollution sources and also that water quality managers and the general citizenry will have access to up to date information of water quality conditions.

Investing the necessary resources to update the Water Quality Classification Maps to accurately portray existing conditions is not warranted and I support the proposed deletion of WQS#31.

Inland Surface Water Classifications and Criteria

Class AA, A, and B

Biological Condition. I suggest a slight rewording for clarity. In the second sentence, biological communities should be singular, i.e. biological community. Also, I suggest that the last phrase in that sentence be revised thus: "..., water quality shall be sufficient to sustain a biological condition **WITHIN THE RANGE OF CONNECTICUT BIOLOGICAL CONDITION GRADIENT TIERS 1-4 AS** assessed along a 6 tier stressor gradient of Biological Condition. (see Appendix H).

Identical wording should be used for all Classes.

Nutrients. I suggest that "be limited to" be replaced with "shall not exceed"

Class B

Color. I am reminded of concerns regarding allocation of Zones of Influence expressed previously.

Lake Trophic Categories

I found the introductory paragraph poorly worded and offer the following editorial suggestions for clarity:

"The ranges of Total Phosphorus, Total Nitrogen, Chlorophyll-a, and Secchi Disk Transparency appearing in Table 1 below are assessed **COLLECTIVELY** (in conjunction with each other) to determine the **CURRENT** trophic state of a lake. In **ADDITION TO** (conjunction with) water column data, the trophic state of a lake is **ASSESSED BASED ON** (determined by) the percent**AGE** of the surface area covered by macrophytes in accordance with Table 2 below. For the purpose of determining consistency with the WQS, the **NATURAL** trophic state of a lake **IS COMPARED WITH THE CURRENT TROPHIC STATE** (must be assessed) to determine **IF** the (attainable) trophic state of the lake **HAS BEEN ALTERED DUE TO CULTURAL ENRICHMENT**. Lakes in advanced trophic states **WHICH EXCEED THEIR NATURAL TROPHIC STATE DUE TO CULTURAL ENRICHMENT** (beyond their attainable) are considered to be inconsistent with WQS.

Table 1. Within this table it would be beneficial if some of the positive benefits of healthy eutrophic lake systems could be enumerated. For example, due to low levels of productivity, oligotrophic lakes have low potential to support the large fish biomass required to sustain heavy fishing pressure. Eutrophic lakes however frequently are identified as among CT's most valuable resources for recreational fishing. Water contact recreation may be limited as indicated as productivity increases. At the same time, the potential wildlife value, particularly for waterfowl and other water dependent bird species such as Bald Eagles and Ospreys, and mammals such as beavers, muskrats, otters, and

others is much higher in meotrophic and eutrophic systems. Human uses such as water contact recreation may be limited, but aquatic life and wildlife uses may be enhanced. Some balance in the presentation would be beneficial.

Table 2 would benefit from reformatting for clarity. I suggest that the left most column entries be limited to one trophic state per row rather than lumping several states together.

Trophic State (WQ)	Percent Macrophytes	Lake Trophic State
Oligotrophic	<30	Oligotrophic
	30-75	Mesotrophic
	>75	Highly Eutrophic
Mesotrophic	<30	Mesotrophic
	30-75	Eutrophic
	>75	Highly Eutrophic
Eutrophic	<30	Eutrophic
	30-75	Eutrophic
	>75	Highly Eutrophic

Coastal Water Classifications and Criteria

I have no comments regarding this section except to suggest a review for consistency with the Inland Waters section that precedes it.

Appendix A Definitions.

A decision should be made as to whether the definitions presented are primarily included for general informational purposes or if the intent is rather to provide explicit, precise definitions for the purpose of reducing uncertainty in implementation of the WQS. Evidence of the need for that determination is provided by the numerous definitions that could be replaced with a simple reference to a statutory definition upon which the definition appearing here is clearly derived. Providing additional explanatory text here may serve to actually increase uncertainty in application. Examples include such defined terms as “Coastal Waters, Discharge Toxicity Evaluation, Point source,, Sewage, Special Aquatic Sites, Special Wetlands, and many others.

A second general suggestion is to conduct a “word search” on the final document and delete the definitions for those terms no longer appearing in the WQS or the appendices. This is most easily accomplished electronically and I have not attempted it but suspect there are many terms defined that no longer appear in the WQS.

Anti-degradation Policy – this definition should be modified to include reference to **OVERRIDING ECONOMIC OR SOCIAL BENEFITS TO THE STATE** as well as the area where the water is located. This change is critical to maintaining the meaning and

intent of the proposed changes to WQS #3. If, in fact, those proposed changes are not adopted in the final version, this definition, as it currently appears would be incorrect since the current reference is to statewide benefit analysis only.

Classification. This definition begs modification to reflect the proposed change to drop the “slash” classification.

Criteria. This definition should be modified to include “mass loading” as an acceptable means of expressing criteria.

Cultural Enrichment. I suggest the following: “means the addition of (excess) nutrientS (input) into surface waters from human sources THAT, in combination with other habitat factors, RESULTS IN ELEVATED (may cause high) biological productivity AS MAY BE characterized by severe blooms of algae and/or extensive areas of dense macrophyte beds.

High Quality Waters. I suggest that the qualifier CURRENT be inserted prior to “Biological Condition” and the word (Gradient) be deleted from this definition.

Indicator bacteria. I suggest the addition of OR BIRDS immediately prior to the period at the end of this definition.

Stream Flow Regulation. I suggest insertion of a comma following “dams” and addition of FROM WELLS OR INTAKE STRUCTURES following “withdrawals. Also note current convention is to consider stream flow to be two words.

Threatened, Endangered, or Special Concern Species; Significant Natural Communities. Each term should be defined separately. I see nothing special or unique that would warrant underlining any of the words appearing in this definition and this convention has not been used elsewhere in Appendix A.

Trophic State. This definition is incorrect. Trophic State is a condition that reflects the biological productivity of an ecosystem, not the degree of nutrient enrichment. Although the two are arguably related, they are not the same. I suggest “MEANS THE LEVEL OF BIOLOGICAL PRODUCTIVITY IN A SURFACE WATER.”

Zone of Influence. It is not clear to me whether this definition is sufficiently broad to include all situations where a ZOI may be allocated by the Commissioner. WQS #10 (the longest of the WQS policy statements) provides a full page of descriptive information regarding ZOI and I wonder if this definition is necessary.

Appendix B Water Quality Criteria For Bacterial Indicators Of Sanitary Quality

As general comment, I recommend that staff verify that the documents referenced in the table notes are the most current versions. With respect to the final note, Guidelines for Use of Indicator Bacteria, I see several problems. The initial sentences clearly reflect the

original intent that the Classifications would reflect the current condition, something that they do not do currently and DEP is proposing to eliminate by dropping the “slash” classification system. The most current assessment would be the 305(b) report. That information is also unreliable for the purpose of individual decisions regarding engaging in recreational activities at a specific site. I suggest the best course of action may be to simply delete everything except perhaps the warning to not rely of the classification as a certification of current quality. If a guideline is necessary or thought beneficial, then new text should be drafted explaining that indicator bacteria are imperfect indicators of quality (e.g. they don’t reflect potential contamination with *Cryptosporidium* or *Giardia*) and may overestimate the health risk in situations where indicator density is dominated by non-human sources of bacteria.

Appendix C Dissolved Oxygen (DO) Criteria For Coastal Waters

The reference to “Coastal Waters” in the title should be changed to SAA, SA, and SB Waters since there is some potential for confusion. Reliance on the Classification to define the area of applicability eliminates uncertainty since these areas are mapped and there is no need to interpret a narrative description of what constitutes a coastal water. The reference to “LIS” in the test should also be replaced with “SAA/SA/SB waters” since it may be unclear to some what is meant by “LIS” (there is no prior mention of Long Island Sound). Additionally, some SAA/SA/SB waters such as the Thames, Connecticut, and Housatonic estuaries and some harbor areas are not considered to be a part of LIS by many in the general public although they are classified SAA, SA or SB and covered by the proposed criteria.

The first sentence in the section on Cumulative DO exposure parameters infers that a single numeric criterion is effective for toxic pollutants. Nothing could be further from the truth. Toxic pollutants require consideration of magnitude, duration of exposure, and frequency of exceedance in order to be effectively implemented. Where DO and toxic pollutants differ is that one parameter (DO) causes impacts when there is not enough, and the other (toxics) when there is too much. Otherwise the “dose/response” model works equally well to describe the impact of both. That is not to say that agencies have not attempted to use a single number criterion with no consideration of frequency and duration but they simply don’t work very well. Note the table notes for Appendix D particularly numbers 4,5,8,10, and 11.

I found the table confusing, beginning with the title. I suggest something simpler: Dissolved Oxygen Chronic Cumulative Criteria for SAA, SA, and SB waters. I didn’t try to do the math but I assume staff have verified these equations. A final suggestion is to add AVAILABLE FOR DOWNLOAD ON THE DEP’S WEBSITE (url) OR BY CONTACTING THE DEP AT (address) at the conclusion of the appendix.

Appendix D Numerical Water Quality Criteria for Chemical Constituents

I suggest that either a blank row be inserted every four or five column rows or every fourth or fifth row be highlighted in the final version for ease of use. In the table notes, I

question why the phrase “of ambient waters” is necessary in Note 7 since all criteria apply “in ambient waters”, a term (ambient water) which is not defined. I understand that many in the regulated community would prefer permit limits be expressed as the dissolved fraction yet it is the NPDES regulations that restrict that practice not the WQS and translators are in common usage. There also appears to be some text missing from Note 9, and “Housatonic” is misspelled in Note 12. The addition of an explicit reference as to where authoritative information concerning those parameters listed in Table 2 as “chemical specific” can be found would seem in order. Without knowledge of where to find a BCF, CSF, FCM (or octanol/water partition coefficient) and an RfD, I can’t calculate the criteria. If there are multiple sources for any of these parameters the one DEP expects practitioners to use should be specified as the “authority”.

Appendix E Connecticut Antidegradation Implementation Policy

II Applicability

In section 1, insert period following first reference to Connecticut General Statutes.

In section 2A, I suggest rewording to read: A pollutant WOULD BE (such discharge or activity is proposed to be) released AS A RESULT OF THE DISCHARGE OR ACTIVITY at an increased CONCENTRATION OR MASS (level) which (either in terms of concentration or mass loading) may NEGATIVELY affect water quality and be subject to regulation under a permit, water quality certificate or concurrence;

I do not recall the convention regarding implied “and” when a semicolon appears without conjunction as is the case with 2A. I believe the intent is to convey “and/or” here and leave it to DEP staff to confirm.

I do not see any need for 2B since any increase beyond permitted conditions would qualify the discharge for antidegradation review under 2A. I suggest 2B be deleted in toto.

In 2C I suggest wording similar to that provided in WQS #10 regarding Zones of Influence be used. To accomplish this, replace “The degree or extent of a previously allocated” with The AREA AND/OR VOLUME OF RECEIVING WATER FLOW of a previously allocated...”

I recommend that a section 3 be inserted describing what constitutes a “New” discharge similar to that provided for an “increased” discharge. This provision would serve to exclude from antidegradation review the issuance of permits for pre-existing discharges that require permits simply due to any future expansion of the Commissioner’s authority to regulate. Under NPDES rules, these are considered new discharges. The most recent examples of this would be stormwater discharges and runoff from CAFOs which for many years were considered to be non point sources and outside of the realm of NPDES regulation. It would be inappropriate to consider these as “new” discharges given their historic existence (albeit unpermitted). There are likely other types of currently active

discharges or activities currently unregulated by the Commissioner including many land use-related activities such as agricultural practices and residential development that may at some future time come under DEP's regulatory umbrella. It would not seem appropriate to consider these "new" for antidegradation purposes. Clear guidance regarding whether reissuance of an expired permit will require antidegradation review given that the discharge or activity is not new in terms of novelty but is considered new when applying other portions of the NPDES permitting regulations is also needed.

III General Provisions.

I suggest several wording changes to 2. to enhance clarity. First, change "any" to "A" in the first line. The sentence should conclude "„activity is consistent with the DESIGNATED uses (goals of) ESTABLISHED IN these WQS FOR THE CLASS OF WATER IMPACTED BY THE DISCHARGE OR ACTIVITY, any duly adopted Total Maximum Daily Load,....."

IV Tier 1 Antidegradation Evaluation and Implementation Review.

The purpose statement refers to an "Implementation Procedure while the section title refers to an Implementation Review". Which is it? This inconsistency also appears in Tier 2 and 3 procedures. I also suggest deleting the "the" appearing prior to "Connecticut Water Quality Standard 2".

I note that the word "REVIEWING" has been inadvertently left out in the first sentence of the second paragraph of this section and at similar locations in sections V and VI. In that same paragraph I suggest inserting "ASSIGNED TO THE RECEIVING" and deleting (for the) between "designated uses" and "water body" and replacing the word (utilizing) with CONSIDERING.

The lead sentence introducing the list of factors neglects to include "DISCHARGE OR" and references only "activity" which I believe is unintentional.

In subsection (f) I am concerned regarding the reference to "potential uses" since the term opens up the potential for redefining "uses" in ways that may be inconsistent with the WQS and CWA goals. Assigning "uses" for purposes of regulation under the CWA is serious business and requires greater investment in public debate than is envisioned here. Unless the reference is limited to the "potential drinking water supply" use assigned to Class A waters I recommend dropping this reference.

Subsection (i) is problematic because a decrease in biological condition is reflected in an increase in the biological condition gradient model tier. The most straightforward means of achieving clarity here would be to reword thus: "potential for the proposed discharge or activity to RESULT IN A Biological Condition of 5 OR 6.

Subsection (j) does not explain the implications of discharging highly bioaccumulative, persistent or toxic compounds. It would be preferable to state that the Commissioner will

consider THE RADIOLOGICAL AND TOXICOLOGICAL CHARACTERISTICS AS WELL AS THE PERSISTENCE OF ANY POLLUTANTS THAT MAY BE RELEASED TO THE RECEIVING WATER AS A RESULT OF THE PROPOSED DISCHARGE OR ACTIVITY.

V Tier 2 Antidegradation Evaluation and Implementation Review

In the statement of purpose separate mention is made of “wetlands” although all wetlands are considered to be surface waters under the CWA definitions. Areas defined as wetlands for CWA purposes by EPA (commonly referred to as jurisdictional wetlands) may be redefined based on ongoing litigation. If the intent is to require all discharges or activities potentially impacting wetlands (as defined by Connecticut law) to perform a Tier 2 antidegradation review I suggest a clear definitive statement to that effect would be preferable. However, when drafting such a statement it may be important to note well that wetlands are potentially impacted not only by activities such as dredge and fill regulated by OLISP or IWRD but also by many discharges permitted by NPDES staff including stormwater. In some cases stormwater that is discharged to a wetlands may be responsible for the creation and maintenance of areas that are covered under the State’s definition of what constitutes a wetland. I wholeheartedly concur with requiring all applicants for permits to fill or drain wetlands to perform the alternatives and economic analysis but would recommend careful crafting of this provision so as not to mandate tier 2 review where such review will not yield environmental benefits.

This section presents a procedure for conducting an antidegradation review procedure that is applicable to proposed discharges or activities impacting high quality waters. However, a procedure to identify which waters are high quality and which are not is conspicuously absent. This is perhaps the most critical factor in antidegradation policy application and must be addressed. If the intent is to consider all waters that fully support all designated uses as high quality that should be stated. If the intent is to evaluate quality on a parameter-by-parameter basis (ie high quality for one parameter, not high quality for another) then that interpretation should also be clearly stated. I urge you to consider the difficulties associated with conducting an antidegradation review and alternatives analysis for one parameter but not others present in the same discharge when evaluating that option. Is the decision use-by-use, or do all uses have to be fully supported to qualify as high quality is a reasonable question. Identifying high quality waters where the tier 2 review must be done is the central question.

It is also important to distinguish between “high quality” and “highly valued”. Antidegradation review is not a popularity contest concerned with identifying which surface waters people love the most but should be an unbiased analysis of which waters exhibit higher than necessary quality by some objective measure. This will not be an easy topic to resolve but I believe it is critical as a matter of good public policy to resolve it without ambiguity. My recommendation is to adopt a “use-by-use” approach that considers any water that fully support a use to be high quality for that use. Waters assessed as impaired for a use (e.g. aquatic life use impaired and 303(d) listed) should not be considered as high quality for aquatic life use. Considering all waters with a biological

condition of 3, 2, or 1 as “high quality” for aquatic life use and waters with biological condition of 4, 5, or 6 as not high quality would be an acceptable alternative. A table listing the necessary characteristic for designation as a “high quality” water for each designated use would be the ideal solution.

In subsection 1(a) I was confused. I believe what was meant was “not temporary OR (and) it is expected that...”. Also I suggest adding the phrase “OR ACTIVITY” at the conclusion of the sentence following “discharge”.

In 1(b) I suggest replacing “unused” with “AVAILABLE”, replacing “(a) receiving water” with “THE receiving water”, and rephrase the second clause to read “, or result in (a) THE DISCHARGE OF A pollutant that will not.....”. As an aside, consider whether a waterbody that has little unused assimilative capacity can be of a quality “higher than the minimum necessary”. Perhaps only those waters with an excess of assimilative capacity should be considered “high quality”.

In subsection (c) there is mention of a margin of safety, a term that may have meaning for some but is not defined. As presented it infers that there is some acceptable margin that must be available. I suggest reviewing this provision together with (b) immediately above it and decide if it really is necessary at all.

In (d) I suggest “POLLUTANTS” as a better word choice than “compounds”.

Subsection (f) provides a directive that has the feel of something taken directly from a general permit or other regulatory requirement. Since it is desirable in all cases to maintain a distinction between the WQS and State or federal regulations implementing permit programs, I suggest a simple reference to the source (if a regulation) or if not, delete it. If this is current guidance and the intent is to mandate its implementation, then the place to do that is through the permitting program, not through the WQS. Further, the reference to “State Standards and Criteria” is inappropriately vague and suggests that consistency with this provision would involve compliance with requirements beyond the scope of the WQS (NB State Standards could include the building code, No Child Left Behind, or less bizarrely DPH regulations, etc).

In (g) some reference to statute, regulation, or widely accepted published scientific reports, or official DEP/EPA guidance describing how these particular locations are defined is necessary. Modification of the definition provided in Appendix A may suffice.

In section 2 for consistency reference should be made as to the scale of the economic and social development (i.e. local and/or statewide). I also question the need to underline this phrase since that convention has not been used elsewhere in the WQS to draw attention to a particular phrase. “WILL” is missing between “requirements” and “be achieved” as well as between “stormwater controls” and “be implemented”.

I have no comments regarding the alternatives or economic analysis except to note a typographical error on page E-6, B. Economics Need should be singular Economic. I also

noted a similar minor edit on page E-7 (v) is necessary, “their” should be “THE”. Consideration should be given to identifying appropriate staff for purposes of implementing the economic analysis since it is my understanding that talent in that subject area will be difficult to find among professionals whose principal area of expertise is environmental analysis.

Appendix F Minimum Temperature Requirements For Cold, Cool, and Warm Water Aquatic Habitats.

This appendix represents a reasonable initial effort to better address the need for comprehensive temperature criteria in the WQS. Adoption of these provisions should be viewed as laying the groundwork for future revisions and DEP should anticipate the need to devote resources to the development of a sound scientific basis for revising these criteria during the period leading up to the next triennial review. My recommendation regarding this future investigation would be to focus attention on developing a reliable means of identifying cold, cool, and warm habitats *a priori* based on sub-surface geology and landscape variables such as stratified drift, forested land cover, and impoundments with a goal of producing a map that identifies surface waters by habitat category. Additional investigative work is also necessary to establish natural patterns of temperature in selected habitats representative of the variety of habitats found in Connecticut to facilitate development of criteria that are consistent with the Biological Condition Gradient Model.

In the section dealing with cold water habitats, I suggest that the qualifier NATIVE be inserted in front of “cold water fish species” and that Connecticut’s only native trout, the Brook trout (actually a char) be provided as the example rather than the general reference to the Salmonid family of fishes. Consideration should be given to listing additional cold water indicator species.

A second suggestion is to reconsider the time periods established for the temperature criteria with a goal of making these periods consistent with the bioperiods proposed for establishing stream flow standards in a separate action currently ongoing at DEP. As proposed, the “winter” period includes the overwinter, salmonid spawning, and portions of the rearing and growth and habitat forming bioperiods. The “summer” period includes the clupeid spawning, resident spawning, and portions of the habitat forming and rearing and growth bioperiods. While there may not currently be sufficient scientific justification to establish 6 temperature regimes as was done for stream flow, the possibility of establishing “temperature-applicability” periods that do not split a bioperiod should be explored. Temperature and stream flow are arguably among the most important environmental variables influencing the distribution and abundance of fish species. Both parameters tend to exhibit predictable annual cyclic trends and many species of aquatic organisms have adapted life cycles in response to this pattern. DEP should consider developing consistency between temperature criteria and stream flow standards as a necessary step towards integrated water resource management.

It may also be necessary to define the metrics “average weekly temperature” and “maximum daily temperature” for purposes of the WQS. This is particularly important due to the more frequent use of continuous recording devices for temperature monitoring by water quality professionals. A definition would also provide clarification with regard to how DEP will assess consistency with these criteria based on infrequent measurements (i.e. single “grab”) that may be provided by volunteer monitors. For example, TV weathermen report the highest instantaneous temperature of the day as the “daily maximum” whereas NPDES permittees consider the “daily maximum limit” to represent a 24 hour average temperature. Clarity is called for.

Appendix G Implementation Strategy For Nutrient Control

This appendix describes Connecticut’s strategy to implement comprehensive nutrient controls through structured application of existing narrative criteria to regulatory decision making and identifies accountability measures to ensure that progress is being made in reducing nutrients loads from current levels. This strategy has been in development over a number of years and has been reviewed favorably by professional water quality managers, environmentalists, and the regulated community as a reasonable and intelligent approach to address the problem of nutrient pollution. Alternative approaches, most specifically traditional approaches based on adoption of broad-based numeric criteria, have proven to be unnecessarily costly, highly litigious, and most importantly ineffective in achieving reductions of the magnitude necessary to achieve water quality goals in those jurisdictions where implementation has been attempted. The fundamental reason for these failures lies in the unique non-threshold response of ecosystems to nutrient enrichment. Nutrient management based on the threshold dose/response model that has functioned well for toxic pollutants fails when applied to nutrients because there is no underlying scientific basis of support. Achieving significant nutrient reductions requires a different approach and the proposed strategy provides that.

Adoption of the strategy and aggressive implementation is contingent to a large degree upon garnering EPA approval, or at the least tacit acceptance. The appendix therefore should focus on providing the necessary justification to EPA to encourage approval. The “Silva Memo” referenced in the opening paragraphs provides insight into the arguments that EPA may find most persuasive. Importantly, Mr. Silva notes that EPA’s Clean Water Act oversight authority is ‘limited and discretionary in scope’ and is limited to those situations where EPA can support a determination that a State needs new or revised criteria to meet the requirements of the CWA. He also enumerates those factors that EPA will consider in making that determination. These are the factors that should be addressed in the appendix.

Principal among the factors for EPA to consider is whether the absence of numeric criteria is an important factor in a State’s inability to protect designated uses of their waters. For nitrogen, a clear case has been made through Connecticut’s past performance that the answer is “no”. Significant reductions have already been documented and those reductions have resulted in water quality improvements. Progress continues to be made in reducing nitrogen loads at a pace exceeding that achieved in any other jurisdiction

nationwide including those where EPA has primary responsibility for implementing the regulatory program. Importantly, those reductions have been quantified at an exceptional level of precision and detail and accountability measures incorporated into Connecticut's program have proven to be highly effective in motivating responsible parties to participate in achieving those reductions. Connecticut's nitrogen strategy has reduced loads to both waters that have been assessed as impaired as well as those not currently impaired, making any argument that the absence of numeric criteria contribute to any "inability to protect" moot since there clearly is no lack of ability.

For phosphorus the case remains to be made since DEP is in the initial phases of implementing the proposed approach. The paragraphs devoted to the phosphorus strategy seem to state "CT has a strategy" and "EPA should approve it" but the description of what that strategy is should be more forcefully presented.

As I understand it, the strategy involves establishing the maximum allowable loading originating from three distinct land covers, forested, agricultural, and urban. The maximum acceptable loadings from agricultural and urban land covers are established at levels significantly lower than current conditions. Achieving consistency with the criteria and ensuring protection of designated uses will require reductions in nutrient loads through aggressive application of BMPs to agricultural and urban non point sources. This is a critical point since nearly all practitioners agree that no program to effectively manage nutrients loads and mitigate nutrient pollution can succeed without addressing non-point sources. In Connecticut, elimination of all loading from point sources will not achieve water quality goals absent reductions in non point loads regardless of the resources expended.

The strategy also effectively addresses point discharges containing nutrients. Based on a comparison of the relative magnitude of total loading contributed by human influences (the enrichment factor), the strategy assigns each point discharge to one of three BMP control levels. The BMP level established through implementing the strategy can then be easily converted into regulatory permit limits by DEP permitting program staff. These limits will require either a freeze at current nutrient loading levels or a reduction from current levels. No allowance for a future increase in load and a legally enforceable requirement to reduce loads at those facilities most likely to cause or contribute to the impairment of a designated use (high enrichment factor) ensures that designated uses will be achieved and maintained.

The logical conclusion to be reached following consideration of the strategy is that numeric criteria are not necessary to meet the requirements of the CWA since implementation of the strategy will result in Connecticut having in place an "appropriate and effective set of controls and measures to achieve nutrient loading reductions that will assure compliance with applicable water quality standards".

It needs to be bluntly stated:

The strategy presented in Appendix G ensures that WQS will be met. It addresses both point and non point sources of nutrients. It correctly focuses on nutrient loads. It provides site-specific numeric loadings that function as criteria for permitting and TMDL development. It provides a foundation for imposition of legally enforceable water quality-based NPDES permit limits issued under the Commissioner's existing authority. It incorporates accountability measures. It is feasible to implement. It represents the most cost-effective means of achieving rapid and significant reductions from current load levels. It is based on sound scientific principles.

It has much to recommend it and I would endorse adoption and implementation under State authority in the event that EPA withholds timely approval and further delays efforts by CT-DEP to reduce nutrient loads to Connecticut surface waters.

Appendix H Connecticut Biological Condition Gradient Model

This appendix might benefit from a brief (perhaps one paragraph) description of the basis for the model, specifically, ecosystem response to stressor and some statement regarding the broad applicability of the model to a broad range of ecosystem types.