

## Final Proposed Filing - Coversheet

### Instructions:

In accordance with Title 3 Chapter 25 of the Vermont Statutes Annotated and the “Rule on Rulemaking” adopted by the Office of the Secretary of State, this filing will be considered complete upon filing and acceptance of these forms with the Office of the Secretary of State, and the Legislative Committee on Administrative Rules.

All forms shall be submitted at the Office of the Secretary of State, no later than 3:30 pm on the last scheduled day of the work week.

The data provided in text areas of these forms will be used to generate a notice of rulemaking in the portal of “Proposed Rule Postings” online, and the newspapers of record if the rule is marked for publication. Publication of notices will be charged back to the promulgating agency.

**PLEASE REMOVE ANY COVERSHEET OR FORM NOT REQUIRED WITH THE CURRENT FILING BEFORE DELIVERY!**

**Certification Statement:** As the adopting Authority of this rule (see 3 V.S.A. § 801 (b) (11) for a definition), I approve the contents of this filing entitled:

**Vermont Water Quality Standards**

/s/ Julie Moore

, on 09/20/2022

(signature)

(date)

Printed Name and Title:

Julie Moore, Secretary  
Agency of Natural Resources

RECEIVED BY: \_\_\_\_\_

- Coversheet
- Adopting Page
- Economic Impact Analysis
- Environmental Impact Analysis
- Strategy for Maximizing Public Input
- Scientific Information Statement (if applicable)
- Incorporated by Reference Statement (if applicable)
- Clean text of the rule (Amended text without annotation)
- Annotated text (Clearly marking changes from previous rule)
- ICAR Minutes
- Copy of Comments
- Responsiveness Summary

1. TITLE OF RULE FILING:

**Vermont Water Quality Standards**

2. PROPOSED NUMBER ASSIGNED BY THE SECRETARY OF STATE

22P 009

3. ADOPTING AGENCY:

Agency of Natural Resources

4. PRIMARY CONTACT PERSON:

*(A PERSON WHO IS ABLE TO ANSWER QUESTIONS ABOUT THE CONTENT OF THE RULE).*

Name: Bethany Sargent, DEC Monitoring and Assessment Program

Agency: Agency of Natural Resources

Mailing Address: 1 National Life Drive, Davis 3, Montpelier, VT 05620-3522

Telephone: (802) 490-6131 Fax: (802) 828-1544

E-Mail: bethany.sargent@vermont.gov

Web URL *(WHERE THE RULE WILL BE POSTED)*:

<https://dec.vermont.gov/watershed/>

5. SECONDARY CONTACT PERSON:

*(A SPECIFIC PERSON FROM WHOM COPIES OF FILINGS MAY BE REQUESTED OR WHO MAY ANSWER QUESTIONS ABOUT FORMS SUBMITTED FOR FILING IF DIFFERENT FROM THE PRIMARY CONTACT PERSON).*

Name: Hannah Smith

Agency: Agency of Natural Resources

Mailing Address: 1 National Life Drive, Davis 2, Montpelier, VT 05620-3522

Telephone: (802) 461-8187 Fax: (802) 828-1544

E-Mail: hannah.smith@vermont.gov

6. RECORDS EXEMPTION INCLUDED WITHIN RULE:

*(DOES THE RULE CONTAIN ANY PROVISION DESIGNATING INFORMATION AS CONFIDENTIAL; LIMITING ITS PUBLIC RELEASE; OR OTHERWISE, EXEMPTING IT FROM INSPECTION AND COPYING?)* No

IF YES, CITE THE STATUTORY AUTHORITY FOR THE EXEMPTION:

PLEASE SUMMARIZE THE REASON FOR THE EXEMPTION:

7. LEGAL AUTHORITY / ENABLING LEGISLATION:

*(THE SPECIFIC STATUTORY OR LEGAL CITATION FROM SESSION LAW INDICATING WHO THE ADOPTING ENTITY IS AND THUS WHO THE SIGNATORY SHOULD BE. THIS SHOULD BE A SPECIFIC CITATION NOT A CHAPTER CITATION).*

10 V.S.A. §§ 1251a and 1252(e)

8. EXPLANATION OF HOW THE RULE IS WITHIN THE AUTHORITY OF THE AGENCY:

It is the policy of the State of Vermont to protect and enhance the quality, character and usefulness of the State's surface waters. The Agency of Natural Resources is authorized to adopt rules necessary for the administration of a water pollution control program. Pursuant to 10 V.S.A. § 1252(e), the Agency of Natural Resources is expressly authorized to adopt water quality standards to protect and enhance the condition of Vermont's surface waters.

9. THE FILING HAS CHANGED SINCE THE FILING OF THE PROPOSED RULE.

10. THE AGENCY HAS INCLUDED WITH THIS FILING A LETTER EXPLAINING IN DETAIL WHAT CHANGES WERE MADE, CITING CHAPTER AND SECTION WHERE APPLICABLE.

11. SUBSTANTIAL ARGUMENTS AND CONSIDERATIONS WERE NOT RAISED FOR OR AGAINST THE ORIGINAL PROPOSAL.

12. THE AGENCY HAS INCLUDED COPIES OF ALL WRITTEN SUBMISSIONS AND SYNOPSES OF ORAL COMMENTS RECEIVED.

13. THE AGENCY HAS INCLUDED A LETTER EXPLAINING IN DETAIL THE REASONS FOR THE AGENCY'S DECISION TO REJECT OR ADOPT THEM.

14. CONCISE SUMMARY (150 WORDS OR LESS):

The Vermont Water Quality Standards (WQS) are being amended to clarify applicability of the Standards, reflect updates to policy related to streamflow and stream processes, update water quality criteria for consistency with federal standards, and reflect changes enacted under Act 32 of 2021. Amendments to the Rule include:

1. Language regarding the application of the Standards to wetlands;
2. Language articulating the requirements of state certifications issued pursuant to Section 401 of the CWA;

3. Update to aquatic biota-based criteria clarifying that 30Q10 flows apply for chronic criteria that utilize a 30-day average;
4. Updates to methodology associated with determining hydrology criteria;
5. Updates to methodology associated with numeric biological indices and aquatic habitat assessments;
6. Updates to the Management Objectives and Criteria;
7. Reclassification of three A(1) streams in the Lower Otter Creek Watershed;
8. Changes to Appendix C, including updates to aluminum and copper criteria

**15. EXPLANATION OF WHY THE RULE IS NECESSARY:**

Federal law, including 33 U.S.C. § 1313 and 40 C.F.R. §§ 131.4-131.6 and 131.10-131.15, and Vermont Statutes Annotated Chapter 47 (Water Pollution Control), specifically 10 V.S.A. §§ 1250-1252, require the State to adopt water quality standards. The WQS have been adopted accordingly and satisfy these federal and state requirements. Pursuant to 33 U.S.C. § 1313 and 40 C.F.R. § 131.20, the State must conduct a triennial review of the WQS. The purpose of the triennial review is for the State to update its water quality standards as appropriate, consistent with new legal and scientific information and federally promulgated standards and regulations. The proposed amendments to the WQS satisfies the triennial review requirement, while also updating the Rule consistent with state law, including updates required pursuant to Act 32 of 2021.

**16. EXPLANATION OF HOW THE RULE IS NOT ARBITRARY:**

The Rule is not arbitrary because proposed amendments were developed in accordance with applicable state and federal requirements, including 40 C.F.R. Part 131, and 10 V.S.A. §§ 1250-1252. 40 C.F.R. § 131.6 explicitly lists the elements that must be included in each State's water quality standards. The proposed amendments to this rule reflect the criteria necessary to achieve the purposes of water classifications as required under 10 V.S.A. § 1252, and protect the designated uses of Vermont's waters as required under 40 C.F.R. §131.6. All updates to numeric criteria

listed in Appendix C (Water Quality Criteria for the Protection of Human Health and Aquatic Biota) have been reviewed by the EPA and are consistent with federally promulgated standards. The proposed amendments were carefully drafted to meet state and federal requirements without exceeding the Agency's statutory authority.

**17. LIST OF PEOPLE, ENTERPRISES AND GOVERNMENT ENTITIES AFFECTED BY THIS RULE:**

State and federal agencies and departments, particularly the Agency of Natural Resources; the Vermont Agency of Agriculture, Food & Markets; the Vermont Agency of Transportation; and the Vermont Agency of Human Services, Department of Health. These agencies and departments work in partnership to implement the WQS.

Municipalities with permits requiring compliance with the WQS.

Private enterprises, businesses, and individual citizens whose operations, development, or land-use activities require a permit or certification to ensure compliance with the WQS.

Broadly, residents of the State of Vermont, who derive economic and public health benefits from the maintenance of surface waters in such condition that their designated uses may be realized.

**18. BRIEF SUMMARY OF ECONOMIC IMPACT (150 WORDS OR LESS):**

The amendments regarding the application of the Rule to wetlands, consistent with Act 32, are expected to have negligible economic impact because they are intended to clarify existing policy.

Amendments regarding the requirements associated with 401 Water Quality Certifications, consistent with Act 32, are expected to have a negligible economic impact because information regarding project alternatives is typically provided as a component of an application for a federal license or permit.

Changes to criteria, including aquatic habitat assessments, are expected to have negligible economic impact because they clarify the evaluation methods currently used.

Amendments to Appendix C may have an impact on WWTF operators required to implement new technology to meet the standards.

Landowners within the watersheds of the reclassified A(1) waters must comply with restrictions on the discharge of wastes to those waters, which may nominally impact the development potential of their property.

19. A HEARING WAS HELD.

20. HEARING INFORMATION

(THE FIRST HEARING SHALL BE NO SOONER THAN 30 DAYS FOLLOWING THE POSTING OF NOTICES ONLINE).

IF THIS FORM IS INSUFFICIENT TO LIST THE INFORMATION FOR EACH HEARING, PLEASE ATTACH A SEPARATE SHEET TO COMPLETE THE HEARING INFORMATION.

Date: 7/12/2022

Time: 06:00 PM

Street Address: 190 Junction Road, Berlin Vermont

Zip Code: 05602

Date:

Time: AM

Street Address:

Zip Code:

Date:

Time: AM

Street Address:

Zip Code:

Date:

Time: AM

Street Address:

Zip Code:

21. DEADLINE FOR COMMENT (NO EARLIER THAN 7 DAYS FOLLOWING LAST HEARING):

7/22/2022

KEYWORDS (PLEASE PROVIDE AT LEAST 3 KEYWORDS OR PHRASES TO AID IN THE SEARCHABILITY OF THE RULE NOTICE ONLINE).

Water Quality Standards

Vermont Water Quality Standards

WQS

Antidegradation

Section 401

Water Quality Certification

Hydrology criteria

Water quality criteria

Water quality classification



State of Vermont  
Department of Environmental Conservation  
Office of General Counsel  
1 National Life Drive – Davis 2  
Montpelier, VT 05620-3802

AGENCY OF NATURAL RESOURCES

September 20, 2022

**RE: Final Proposed Amendments to the Vermont Water Quality Standards  
Filing No. 22P-009**

Dear Senator MacDonald and Members of the Committee,

The Agency of Natural Resources is filing the Final Proposed Amendments to the Vermont Water Quality Standards for review by LCAR. The Agency has made the following changes to the Final Proposed Ruel amendments in response to public comments and based upon the Agency's final review of the Rule. The "Response Summary" included in this rulemaking package further explains the reasons for these changes.

**1. Subchapter 1, § 29A-101, *Applicability***

The Proposed Rule included language stating that the "applicable Water Quality Standards shall be those in effect at the time of final administrative disposition of a permit or certification." The initial Proposed Rule language also defined "final administrative disposition" as the date upon which a draft permit is placed on public notice. In response to comment from EPA Region 1, the language regarding final administrative disposition of a permit was struck and replaced with the following: "The applicable Water Quality Standards shall be those in effect at the time of final permit or certification issuance." This change is intended to conform with the federal requirement that applicable water quality standards adopted pursuant to the Clean Water Act are those standards in effect at the time of permit issuance.

**2. Subchapter 1, § 29A-101, *Applicability***

Regarding applicability of the Water Quality Standards to projects subject to Federal Energy Regulatory Commission (FERC) licenses, the Proposed Rule language stated that the applicable Water Quality Standards shall be those in effect at the time that the FERC issues public notice of an application for a License. In response to comment, this language was struck and replaced with the following: "Concerning Water Quality Certification for a License, or the renewal of a License, issued by the Federal Energy Regulatory Commission (FERC), the applicable Water Quality Standards shall be those in effect at the time that the FERC issues public notice of an application ready for environmental analysis for a License." This change is intended to clarify that while FERC provides various notices throughout the licensing process, FERC issuance of notice of application ready for environmental analysis is the point at which the Standards are triggered. This corresponds with the point at which FERC license applicants apply to the Agency for Water Quality Certification of their project.

**3. Subchapter 1, § 29A-102, *Definitions***

In response to comment, the existing definition of "mixing zone" is being modified to include the underlined final sentence: "Mixing zone" means a length or area within waters required for the dispersion and dilution of waste discharges adequately treated to meet federal and state treatment requirements and within which it is recognized that specific water uses or water quality criteria





associated with the assigned classification for such waters may not be realized. A mixing zone shall not extend more than 200 feet from the point of discharge. A mixing zone shall not be used to meet water quality criteria for bioaccumulative toxins. This change is intended to clarify that is intended to clarify that the Agency does not use mixing zones to meet Water Quality Standards for bioaccumulative toxins.

#### 4. Appendix F

In response to comment, a bullet is being added to the introductory heading stating: “The waters listed in the following table are those waters classified as A(1), A(2), or B(1) for one or more designated uses.” This change is intended to clarify that the charts for Appendix F on pages 68 through 93 indicate changes in classification for specific designations.

Please let me know if you have any questions about the foregoing changes.

Sincerely,

A handwritten signature in cursive script, appearing to read "Hannah Smith".

Hannah Smith, Associate General Counsel  
Department of Environmental Conservation

## Adopting Page

### **Instructions:**

This form must accompany each filing made during the rulemaking process:

Note: To satisfy the requirement for an annotated text, an agency must submit the entire rule in annotated form with proposed and final proposed filings. Filing an annotated paragraph or page of a larger rule is not sufficient. Annotation must clearly show the changes to the rule.

When possible, the agency shall file the annotated text, using the appropriate page or pages from the Code of Vermont Rules as a basis for the annotated version. New rules need not be accompanied by an annotated text.

.....

1. TITLE OF RULE FILING:

**Vermont Water Quality Standards**

2. ADOPTING AGENCY:

Agency of Natural Resources

3. TYPE OF FILING (*PLEASE CHOOSE THE TYPE OF FILING FROM THE DROPDOWN MENU BASED ON THE DEFINITIONS PROVIDED BELOW*):

- **AMENDMENT** - Any change to an already existing rule, even if it is a complete rewrite of the rule, it is considered an amendment if the rule is replaced with other text.
- **NEW RULE** - A rule that did not previously exist even under a different name.
- **REPEAL** - The removal of a rule in its entirety, without replacing it with other text.

This filing is **AN AMENDMENT OF AN EXISTING RULE** .

4. LAST ADOPTED (*PLEASE PROVIDE THE SOS LOG#, TITLE AND EFFECTIVE DATE OF THE LAST ADOPTION FOR THE EXISTING RULE*):

SOS Log #14-035, Vermont Water Quality Standards,  
January 15, 2017



## INTERAGENCY COMMITTEE ON ADMINISTRATIVE RULES (ICAR) MINUTES

**Meeting Date/Location:** May 9, 2022, virtually via Microsoft Teams  
**Members Present:** Chair Douglas Farnham, Brendan Atwood, Diane Bothfeld, Jared Adler, Jennifer Mojo, Michael Obuchowski, and Donna Russo-Savage (left early)  
**Members Absent:** Diane Sherman and John Kessler  
**Minutes By:** Melissa Mazza-Paquette

- 2:02 p.m. meeting called to order, welcome and introductions.
- Review and approval of minutes from the April 11, 2022 meeting.
- Note: Emergency Rule Titled 'Nursing Home Rate Setting Staffing Adjustment' by the Agency of Human Services, Department of Vermont Health Access, was supported by ICAR Chair Farnham on 04/27/22.
  - This emergency rule addresses costs at nursing homes associated with increased nursing staffing costs by increasing the existing inflation factor in the Division of Rate Setting's rules to account for the increased inflation in nursing care costs since the beginning of state fiscal year 2022.
- No additions/deletions to agenda. Agenda approved as drafted.
- Public comment:
  - Public comments received from Sylvia Knight and Michael Bald.
- Presentation of Proposed Rules on pages 2-3 to follow.
  1. Transitional Housing Program Rules, Agency of Human Services, Department for Children and Families, page 2
  2. Vermont Water Quality Standards, Agency of Natural Resources, page 3
- Other business.
  - Discussion about ICAR's role in the rulemaking and authority structure in Vermont's government, equity and accessibility to all, and public notification.
    - Include item on the June 13, 2022 agenda for continued discussion and possible future action items:
      - Inter-agency/department communications on proposed filings.
      - Annual internal survey pertaining to anticipated upcoming proposed rules.
- Next scheduled meeting is Monday, June 13, 2022 at 2:00 p.m.
- 3:40 p.m. meeting adjourned.

**Proposed Rule: Vermont Water Quality Standards, Agency of Natural Resources**  
**Presented By: Hannah Smith, Pete LaFlamme, and Bethany Sargent**

Motion made to accept the rule by Brendan Atwood, seconded by Diane Bothfeld, and passed unanimously except for Jen Mojo who abstained, with the following recommendations:

1. Proposed Filing Coversheet, #8: Correct numbering sequence.
2. Economic Impact Analysis, #9: Describe how the analysis was conducted, identifying relevant internal and or external sources of information to describe what was examined.
3. Environmental Impact Analysis, #9: Describe how the analysis was conducted, identifying relevant internal and or external sources of information to describe what was examined, including the environmental data set or framework.
4. Public Input Maximization Plan: Include reach out to the Agencies of Transportation and Agriculture, Food and Markets.
5. Proposed Rule, Footnotes, Page 64 of Clean Text: Committee accepted presenter's request to strike the 'o' footnote. Update link in footnote 'r'.

DRAFT

## Economic Impact Analysis

### **Instructions:**

In completing the economic impact analysis, an agency analyzes and evaluates the anticipated costs and benefits to be expected from adoption of the rule; estimates the costs and benefits for each category of people enterprises and government entities affected by the rule; compares alternatives to adopting the rule; and explains their analysis concluding that rulemaking is the most appropriate method of achieving the regulatory purpose. If no impacts are anticipated, please specify “No impact anticipated” in the field.

Rules affecting or regulating schools or school districts must include cost implications to local school districts and taxpayers in the impact statement, a clear statement of associated costs, and consideration of alternatives to the rule to reduce or ameliorate costs to local school districts while still achieving the objectives of the rule (see 3 V.S.A. § 832b for details).

Rules affecting small businesses (excluding impacts incidental to the purchase and payment of goods and services by the State or an agency thereof), must include ways that a business can reduce the cost or burden of compliance or an explanation of why the agency determines that such evaluation isn’t appropriate, and an evaluation of creative, innovative or flexible methods of compliance that would not significantly impair the effectiveness of the rule or increase the risk to the health, safety, or welfare of the public or those affected by the rule.

---

### 1. TITLE OF RULE FILING:

**Vermont Water Quality Standards**

### 2. ADOPTING AGENCY:

Agency of Natural Resources

### 3. CATEGORY OF AFFECTED PARTIES:

*LIST CATEGORIES OF PEOPLE, ENTERPRISES, AND GOVERNMENTAL ENTITIES POTENTIALLY AFFECTED BY THE ADOPTION OF THIS RULE AND THE ESTIMATED COSTS AND BENEFITS ANTICIPATED:*

Federal and state government agencies, private enterprises, businesses, and individual citizens whose operations, development, or land-use activities require a permit or certification to ensure compliance with the WQS may be affected by the adoption of this rule.

Updates clarifying the application of the standards to wetlands and articulating the requirements associated

with Section 401 Water Quality Certifications, pursuant to Act 32, are expected to have negligible economic impact because they simply clarify existing policy with regard to wetlands and 401 Certification applications, consistent with federal requirements. Information regarding project alternatives is currently provided by most applicants for federal permits; the burden from this change will fall on Agency staff reviewing 401 applications to evaluate the sufficiency of the alternatives analysis, and provide an assessment of that analysis in each Certification issued.

Striking the applicability language in Section 29A-101 is expected to have a negligible impact on regulated entities. Applicants for discharge permits issued pursuant to the State's delegated authority under the Clean Water Act will be required to apply the WQS in effect at the time of permitting decision rather than complete application. In the limited circumstance where the WQS are revised between the time of permit application and permit issuance, an applicant may be required to update their application to address any new applicable standard.

Updates to the hydrology policy and hydrology criteria will have negligible economic impacts on regulated entities. The requirement that applicants conduct site-specific flow studies to determine support of aquatic habitat in Class B(1) waters will likely have an impact on permit applicants required to conduct such studies if applicants had not otherwise intended to conduct site-specific studies.

Updates to the methodology for evaluating aquatic habitat will have negligible economic impact, since the revised methodologies are implicit in the current language broadly requiring habitat assessments.

The reclassification of three streams in the Lower Otter Creek Watershed will have a nominal economic impact on landowners within the watersheds of those streams. Landowners within those watersheds will be prohibited from causing discharges of wastes to the waters, including discharges from on-site wastewater

systems with a capacity of over 1,000 gallons, per 10 V.S.A. 1259.

Updates to Appendix C toxic chemical criteria consistent with EPA criteria are required by federal regulation. The impacts of these criteria updates will be limited to the small number of wastewater treatment facilities and industrial dischargers that discharge one or more of these specific chemicals and that may need to implement additional measures under their next discharge permit to meet the revised standards.

**4. IMPACT ON SCHOOLS:**

*INDICATE ANY IMPACT THAT THE RULE WILL HAVE ON PUBLIC EDUCATION, PUBLIC SCHOOLS, LOCAL SCHOOL DISTRICTS AND/OR TAXPAYERS CLEARLY STATING ANY ASSOCIATED COSTS:*

None.

**5. ALTERNATIVES: CONSIDERATION OF ALTERNATIVES TO THE RULE TO REDUCE OR AMELIORATE COSTS TO LOCAL SCHOOL DISTRICTS WHILE STILL ACHIEVING THE OBJECTIVE OF THE RULE.**

No economic impacts are expected for school districts.

**6. IMPACT ON SMALL BUSINESSES:**

*INDICATE ANY IMPACT THAT THE RULE WILL HAVE ON SMALL BUSINESSES (EXCLUDING IMPACTS INCIDENTAL TO THE PURCHASE AND PAYMENT OF GOODS AND SERVICES BY THE STATE OR AN AGENCY THEREOF):*

No economic impacts are expected for small businesses.

**7. SMALL BUSINESS COMPLIANCE: EXPLAIN WAYS A BUSINESS CAN REDUCE THE COST/BURDEN OF COMPLIANCE OR AN EXPLANATION OF WHY THE AGENCY DETERMINES THAT SUCH EVALUATION ISN'T APPROPRIATE.**

No economic impacts are expected for small businesses; therefore such evaluation isn't appropriate.

**8. COMPARISON:**

*COMPARE THE IMPACT OF THE RULE WITH THE ECONOMIC IMPACT OF OTHER ALTERNATIVES TO THE RULE, INCLUDING NO RULE ON THE SUBJECT OR A RULE HAVING SEPARATE REQUIREMENTS FOR SMALL BUSINESS:*

The proposal is an amendment to an existing rule, required under both federal and state law. Updates to the toxic chemical criteria in Appendix C are required for consistency with standards promulgated by EPA. In the alternative, declining to adopt the proposed

amendments would potentially eliminate the negligible economic impacts described in paragraph 3, at the expense of protecting the quality of Vermont's surface waters.

9. **SUFFICIENCY:** *DESCRIBE HOW THE ANALYSIS WAS CONDUCTED, IDENTIFYING RELEVANT INTERNAL AND/OR EXTERNAL SOURCES OF INFORMATION USED.*

The economic impact analysis examined all anticipated impacts of the amended rule, which were primarily limited to permitting requirements for entities conducting activities potentially resulting in discharges to waters of the State. The analysis examined additional permitting requirements associated with the amended rule, including additional application requirements and potential new treatment requirements, and determined that the economic impacts of the amendmended rule would be negligible in light of current permitting requirements.



## Environmental Impact Analysis

### **Instructions:**

In completing the environmental impact analysis, an agency analyzes and evaluates the anticipated environmental impacts (positive or negative) to be expected from adoption of the rule; compares alternatives to adopting the rule; explains the sufficiency of the environmental impact analysis. If no impacts are anticipated, please specify "No impact anticipated" in the field.

Examples of Environmental Impacts include but are not limited to:

- Impacts on the emission of greenhouse gases
- Impacts on the discharge of pollutants to water
- Impacts on the arability of land
- Impacts on the climate
- Impacts on the flow of water
- Impacts on recreation
- Or other environmental impacts

1. **TITLE OF RULE FILING:**

**Vermont Water Quality Standards**

2. **ADOPTING AGENCY:**

Agency of Natural Resources

3. **GREENHOUSE GAS:** *EXPLAIN HOW THE RULE IMPACTS THE EMISSION OF GREENHOUSE GASES (E.G. TRANSPORTATION OF PEOPLE OR GOODS; BUILDING INFRASTRUCTURE; LAND USE AND DEVELOPMENT, WASTE GENERATION, ETC.):*  
The Rule is not expected to impact the emission of greenhouse gases.

4. **WATER:** *EXPLAIN HOW THE RULE IMPACTS WATER (E.G. DISCHARGE / ELIMINATION OF POLLUTION INTO VERMONT WATERS, THE FLOW OF WATER IN THE STATE, WATER QUALITY ETC.):*

The Vermont Water Quality Standards are adopted for the purpose of classifying Vermont's surface waters, and promulgating narrative and numeric criteria necessary to manage surface waters consistent with their classification, in order to protect and enhance the quality of Vermont's surface waters. The Rule and the

proposed amendments are critical to managing the discharge of pollutants into Vermont waters, regulating the flow of waters in the state, and protecting water quality, including maintenance of designated and existing uses of Vermont's surface waters.

5. **LAND:** *EXPLAIN HOW THE RULE IMPACTS LAND (E.G. IMPACTS ON FORESTRY, AGRICULTURE ETC.):*

The Rule is not expected to impact land or land uses.

6. **RECREATION:** *EXPLAIN HOW THE RULE IMPACT RECREATION IN THE STATE:*

Management objectives and associated criteria for recreation articulated in the Water Quality Standards are intended to protect and enhance the use of Vermont's waters for recreational activities including fishing, swimming, and boating.

7. **CLIMATE:** *EXPLAIN HOW THE RULE IMPACTS THE CLIMATE IN THE STATE:*

The Rule is not expected to impact climate.

8. **OTHER:** *EXPLAIN HOW THE RULE IMPACT OTHER ASPECTS OF VERMONT'S ENVIRONMENT:*

None.

9. **SUFFICIENCY:** *DESCRIBE HOW THE ANALYSIS WAS CONDUCTED, IDENTIFYING RELEVANT INTERNAL AND/OR EXTERNAL SOURCES OF INFORMATION USED.*

The environmental impact analysis examined the potential impacts of the amended rule on Vermont's natural resources, primarily Vermont's surface water resources. The proposed amendments are designed to enhance protection of the State's water resources. The scientific resources that informed the proposed amendments are listed in the Scientific Information Statement of these filing forms; these resources were relied upon to determine the impact the proposed amendments would have on Vermont's water resources.

## Public Input Maximization Plan

### **Instructions:**

Agencies are encouraged to hold hearings as part of their strategy to maximize the involvement of the public in the development of rules. Please complete the form below by describing the agency's strategy for maximizing public input (what it did do, or will do to maximize the involvement of the public).

This form must accompany each filing made during the rulemaking process:

1. TITLE OF RULE FILING:

**Vermont Water Quality Standards**

2. ADOPTING AGENCY:

Agency of Natural Resources

3. PLEASE DESCRIBE THE AGENCY'S STRATEGY TO MAXIMIZE PUBLIC INVOLVEMENT IN THE DEVELOPMENT OF THE PROPOSED RULE, LISTING THE STEPS THAT HAVE BEEN OR WILL BE TAKEN TO COMPLY WITH THAT STRATEGY:

1. During development of the draft Amendments, the Agency consulted technical staff throughout the Watershed Management Division as well as other Divisions in the Department of Environmental Conservation, including the Water Investment Division and the Drinking Water and Groundwater Protection Division. The Agency met with EPA twice, and received and responded to EPA's written comments.

2. Three pre-rulemaking stakeholder meetings were held with large groups of interested stakeholders on March 5, 2021; April 9, 2021; and August 19, 2021. Revised drafts of the amended Rule were circulated before each stakeholder meeting. Stakeholders were invited to submit written comments in April, which the Agency responded to during the third and final stakeholder meeting.

3. Two public meetings were held, in March of 2021 and October of 2021, to solicit public input on the proposed reclassification of Alder Brook (Ripton VT,

## Public Input

Lincoln VT), Blue Bank Brook (Ripton VT, Lincoln VT), and Goshen Brook (Goshen VT, Hancock VT, Ripton VT). The proposed reclassification of these three streams to A(1) was considered by the Agency in response to a petition filed by the Ripton Conservation Commission. Public comments were accepted following both meetings, and a complete Agency response to comments was provided to stakeholders.

4. At least one public meeting will be held during the formal public comment period on the Rule.

### 4. BEYOND GENERAL ADVERTISEMENTS, PLEASE LIST THE PEOPLE AND ORGANIZATIONS THAT HAVE BEEN OR WILL BE INVOLVED IN THE DEVELOPMENT OF THE PROPOSED RULE:

The U.S. Environmental Protection Agency

Vermont Natural Resources Council

Green Mountain Power

Conservation Law Foundation

Vanasse Hangen Brustlin, Inc.

City of Burlington

City of South Burlington

Town of Swanton

Vermont League of Cities and Towns

Gravity Renewables

Central Rivers Power

Vermont Public Power Supply Authority

Morrisville Water and Light Department

Connecticut River Conservancy

Lake Champlain Committee

MMR, LLC

Village of Essex Junction

American Whitewater

Vermont Ski Areas Association

Great River Hydro

Ripton Conservation Commission

## Scientific Information Statement

**THIS FORM IS ONLY REQUIRED IF THE RULE RELIES ON SCIENTIFIC INFORMATION FOR ITS VALIDITY.**

**PLEASE REMOVE THIS FORM PRIOR TO DELIVERY IF IT DOES NOT APPLY TO THIS RULE FILING:**

### **Instructions:**

In completing the Scientific Information Statement, an agency shall provide a summary of the scientific information including reference to any scientific studies upon which the proposed rule is based, for the purpose of validity.

1. TITLE OF RULE FILING:

**Vermont Water Quality Standards**

2. ADOPTING AGENCY:

Agency of Natural Resources

3. BRIEF EXPLANATION OF SCIENTIFIC INFORMATION:

The Vermont Water Quality Standards are informed by numerous scientific studies, reference documents, and guidance materials provided by the Agency as well as the EPA. Those materials specifically relevant to the proposed changes are listed below.

4. CITATION OF SOURCE DOCUMENTATION OF SCIENTIFIC INFORMATION:

1. The Vermont Surface Water Management Strategy (Department of Environmental Conservation, 2010; revised 2017):  
<https://dec.vermont.gov/watershed/map/strategy>

2. The proposed revisions to Appendix G are informed by a longstanding technical guidance document published by the Agency of Natural Resources in 2004, which was peer-reviewed by EPA. The EPA review is available upon request from the Agency of Natural Resources. The full

scientific analysis, which provides the scientific basis for Appendix G, may be found in these three documents:

a.

[https://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/bs\\_wadeablestream1a.pdf](https://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/bs_wadeablestream1a.pdf)

b.

[https://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/bs\\_wadeablestream1b.pdf](https://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/bs_wadeablestream1b.pdf)

c.

[https://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/bs\\_wadeablestream2.pdf](https://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/bs_wadeablestream2.pdf)

3. Updated Appendix C criteria originate from EPA 304a criteria:

[http://dec.vermont.gov/sites/dec/files/wsm/Laws-Regulations-Rules/bs\\_wadeablestream1a.pdf](http://dec.vermont.gov/sites/dec/files/wsm/Laws-Regulations-Rules/bs_wadeablestream1a.pdf).

Specific updates include selenium, aluminum and copper, with links to specific EPA guidance documents below.

Aluminum: <https://www.epa.gov/wqc/aquatic-life-criteria-aluminum>

Copper: <https://www.epa.gov/wqc/aquatic-life-criteria-copper>

Guthion: <https://www.epa.gov/sites/default/files/2018-10/documents/quality-criteria-water-1986.pdf>

Mirex: <https://www.epa.gov/sites/default/files/2018-10/documents/quality-criteria-water-1986.pdf>

Selenium: <https://www.epa.gov/wqc/aquatic-life-criterion-selenium>

Tributyltin (TBT): <https://www.epa.gov/wqc/aquatic-life-criteria-tributyltin-tbt>

4. EPA. 1991. Technical Support Document for Water Quality-based Toxics Control. U.S Environmental Protection Agency, Office of Water, Washington, D.C. EPA/505/2-90-001. March 1991.

<https://www3.epa.gov/npdes/pubs/owm0264.pdf>

5. Complete petition information, documentation of public outreach, public comments, and Agency response to comments on the petitions to reclassify Alder Brook, Blue Bank Brook, and Goshen Brook can be found at the following link:

<https://dec.vermont.gov/watershed/map/stream-reclassification>

**5. INSTRUCTIONS ON HOW TO OBTAIN COPIES OF THE SOURCE DOCUMENTS OF THE SCIENTIFIC INFORMATION FROM THE AGENCY OR OTHER PUBLISHING ENTITY:**

The scientific documents relevant to proposed revisions to the Rule can be accessed online and downloaded as needed at the links provided above.

**From:** [madel51353@aol.com](mailto:madel51353@aol.com)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Wednesday, July 13, 2022 3:00:18 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to presence of bio-accumulative toxins, such as PFAS. This **2014 EPA document** urges AGAINST mixing zones when bio-accumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero.

Considering that the EPA document linked above is from 2014, this new standard should be a wake up call that PFAS as a bio-accumulative toxin should **NEVER** be mixed into or added to our water.

Please do the right thing and stop mixing bio-accumulative toxins in our water.

Sincerely,

Marguerite Adelman  
VT PFAS/Military Poisons Coalition Coordinator  
100 West Canal Street, Unit 4  
Winooski, VT 05404



Dear Ms. Sargent:

As a person of faith and a Vermonter I am concerned about our environment. Water is a precious source for human life as well as all creation, I making the water less healthy. am writing with a formal comment on the Draft Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to presence of bio-accumulative toxins, such as PFAS. This 2014 EPA document urges AGAINST mixing zones when bio-accumulative toxins are involved; you need to pay attention to it. I also assume with the drought and near drought conditions we are experiencing that PFOA and PFOS concentrations may increased

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the EPA document linked above is from 2014, this new standard should be a wake up call that PFAS as a bio-accumulative toxin should **NEVER** be mixed into or added to our water.

Your department has issued a report in 2021 indicating the presence of PFAS in Vermont waters and in fish tissue, and groundwater in some Vermont communities has been contaminated with PFAS.

Please protect water for all people, all life, for all time. Stop mixing bio-accumulative toxins in our water.

Sincerely,

The Venerable Catherine Cooke  
500 south Union Street  
Burlington, VT 05401

address

**DUMP, LLC**  
**“Don’t Undermine Memphremagog’s Purity”**  
**PO Box 1402**  
**Newport, Vermont 05855**

July 22, 2022

Bethany Sargent  
Program Manager, Vermont Department of Environmental Conservation  
Watershed Management Division  
Monitoring and Assessment Program  
1 National Life Drive, Davis 3  
Montpelier, VT 05620-3522

Dear Ms. Sargent,

We write as a subcommittee of DUMP LLC (Don't Undermine Memphremagog's Purity) who have read and reviewed the Vermont Agency of Natural Resources' revisions and updates of Vermont Water Quality Standards. We commend much of the new wording which clarifies intent.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2014.. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near and below zero. Your proposed revisions of Vermont Water Quality Standards are now already out of date, - ie 20ppt for five PFAS for drinking water, - and must be revised to recognize the new EPA advisory levels, which conclude there is virtually no safe exposure level to PFAS which persist and bioaccumulate. In light of these new EPA advisories, we request the public comment period and process be extended to enable the public to review ANR's updated Water Quality Standards.

The class of PFAS compounds, as you know, are well researched as are the harmful effects on human health. These negative health effects are many and include hormone disruption, certain cancers, developmental and behavioral effects, diabetes, obesity, decreased fertility and others. Importantly, it must be recognized that it is insufficient to consider concentrations of individual chemicals within the PFAS class. The effect is additive and test results for hundreds of individual PFAS must be considered in aggregate since individual PFAS chemicals rarely occur alone, but are found in combination with others.

For example, the recently published ANR study of PFAS in fish tissue samples in Lake Memphremagog reports individual PFAS analytes in ppb instead of ppt and does not aggregate results. Samples of PFAS concentrations in Lake Trout only include seven of the 36 PFAS analytes, all of which provides the misleading impression that our PFAS levels in Memphremagog fish are safe for human consumption. The (unnamed) ANR

Don't Undermine Memphremagog's Purity  
nolakedump.com

author's use of concentration units for PFAS for lake water samples (ppt), different from units used for fish tissue samples (ppb), serve to cloud and confuse the public's understanding of exactly what constitutes "safe exposure" and intends to lessen the real magnitude of PFAS, bioaccumulated in fish flesh. The methodology and conclusions reached in the ANR report obfuscate rather than enlighten and clarify.

This concern relates to several sections of the revised Vermont WQS, and requires further revision in order to accommodate the new EPA exposure limits to PFAS. Foremost is the reference to "mixing zones" and "waste management zones". This 2014 EPA document<sup>1</sup> recommends that the term mixing zones be abolished when bioaccumulative toxins are involved. Sixty years ago this year, in her book *Silent Spring*, Rachel Carson spoke of bioaccumulation of chemicals (i.e. DDT) - the build-up of absorbed chemicals in an organism. She also used the term "biomagnification" - the increase in concentration of these chemicals in each organism up the food chain. Were she alive today, Carson would warn strongly against permitting toxic effluent with PFAS to be dumped into "mixing zones", due to their persistence and incapability to be "diluted" as the solution to pollution. Mixing zones in rivers or streams in the era of "forever" PFAS chemicals, does not a clean river make. Recognize that dilution of PFAS toxics in mixing zones is a false assumption. Please heed the science of Rachel Carson and the EPA; Abolish the term Mixing Zones.

DUMP is also concerned with the language regarding Waste Management Zones. As the Memphremagog watershed, and as the Black River being the main tributary to Lake Memphremaog, together are vital to the purity of this drinking water reservoir for 175,000 Canadian citizens, it is imperative that under the VWQS that no technicalities be allowed to lower the quality of incoming waters to the international potable reservoir. We argue that under the Definitions section for "Waste Management Zone" and in Section 29A-204 Special Zones (b), language enabling the direct discharge of "properly treated wastes" into Class B(1) and B(2) waters should be eliminated; or in the case of the Black River, Orleans County, should be exempted due to inability to "properly treat" landfill leachate of a myriad of toxic chemicals, including those within the PFAS family, prior to discharge into the primary tributary to an international drinking water reservoir, potentially affecting thousands of humans. Is it too much to ask that a watershed from which 175,000 humans take their drinking water be treated equally to a river such as the Battenkill, with A classification, for preservation of a fisherman's habitat? We note that the term "properly treated" waste is not defined in your revised standards. To our knowledge, proper treatment of PFAS from landfill leachate on a large scale is still technologically unproven. Have you evidence demonstrating otherwise?

1. "Additionally, states and tribes should carefully consider whether mixing zones are appropriate where a discharge contains bioaccumulative, pathogenic, persistent, carcinogenic, mutagenic, or teratogenic pollutants or where a discharge containing toxic pollutants may attract aquatic life. Bioaccumulative pollutants are one example of a pollutant for which mixing zones may not be appropriate because they may cause significant human health risks such that the designated use of the waterbody as a whole may not be protected. 5 Therefore, the EPA recommends that state and tribal mixing zone policies do not allow mixing zones for discharges of bioaccumulative pollutants. The EPA adopted this approach in 2000 when it amended its 1995 Final Water Quality Guidance for the Great Lakes System at 40 CFR Part 132 to phase out mixing zones for existing discharges of bioaccumulative pollutants within the Great Lakes Basin and ban such mixing zones for new discharges within the Basin."

These terms, Mixing Zones, and Waste Management Zones, should be removed from the revised VWQS due to the known presence of bio-accumulative PFAS compounds in Vermont's waterbodies, including Lake Memphremagog.

Further, the fact that:

- landfill leachate generated at the NEWSVT landfill in Coventry has been disposed of unfiltered for PFAS (and the countless other landfill toxins found in leachate) in several Vermont water bodies including Memphremagog;
- that leachate is proven to "break out", as found in numerous annual inspection reports, from the Coventry landfill and thus runoff from the landfill which contaminates ground water, wetlands and surface waters; Under your revised rules and standards, simply regarding wetlands, the siting of the Coventry landfill adjacent to extensive wetlands, would never be permitted today.
- that ANR permit consideration is being given presently to applications from the landfill owner to permit leachate and groundwater PFAS treatment facilities on site at the landfill- for UD3 effluent and for an experimental "Pilot Project" of the owner's design to "treat" on-site the entire amount of leachate generated by the landfill (millions of gallons per month), with leachate effluent, according to the head NEWSVT engineer, being delivered, directly, end-of-pipe into the Black River
- that all proposed filtration and residual materials, such as GAC, filters, membranes, etc. contaminated with PFAS toxins, are then to be re-dumped into the landfill to result in an increasingly toxic stew from which leachate re-emerges, only to be re-treated
- that the effluent from UD3 would be permitted to be discharged into the bordering wetlands, then the Black River, which flows immediately to the South Bay of Memphremagog

All of the above have direct relationship to language in the revised Vermont WQS regarding "toxic substances" "point source" and "non-point source" discharges that must now be reconsidered in light of the newest EPA advisories.

It is the sole responsibility of the state to identify and manage any and all sources of pollution and to develop the technologies and management plans and practices, including monitoring for compliance, systems and facilities designed to eliminate toxic contamination of Vermont's ground and surface waters. This is too important a societal responsibility to be left solely to private industry to own and to operate. To allow the landfill owner to conduct these public health activities on its own leachate waste is a gross conflict of interest.

Prevention is better than cure. Focus should be placed, not on end-of-pipe standards, but on prevention of toxins from happening in wetland and riparian zones. In the case of the Coventry landfill, a significant start could be made by the State requiring chemical

lab inspections of all incoming loads, where no inspections occur now, other than "eyeball" by compactor operator.

Mixing zones, based on the false assumption that dilution reduces concentrations of forever persistent chemicals such as PFAS, fails to acknowledge bioaccumulation and biomagnification of contaminants in species and upwards along the food chain. Retention of mixing zones is poor science and poor public policy. It does not result in a cleaner river.

Every effort must be taken to ensure the protection of public waters from degradation. The preservation of Vermont's waters takes precedence over any other enterprise, for the sake of the health and safety of Vermont's environment and the public health of Vermonters, international neighbors, and fish and wildlife species within the Memphremagog watershed.

We stand ready to offer more specific suggestions for revisions to the Vermont Water Quality Standards upon your request.

Respectfully submitted,

Henry Coe  
Teresa Gerade  
Ed Stanak  
Peggy Stevens  
Members, DUMP LLC.  
Subcommittee on Review of Permits and Standards.  
Newport, Vermont

13 Claire Pointe Rd.  
Burlington, VT 05408  
[sknightinvt73@gmail.com](mailto:sknightinvt73@gmail.com)  
July 18, 2022

Bethany Sargent  
Program Manager Supervision & Coordination of Monitoring & Assessment Program  
National Life Bldg 3<sup>rd</sup> Floor  
Montpelier VT 05620

SUBJECT: Comments on DRAFT WATER QUALITY STANDARDS 2022

Dear Bethany:

In the last nine months my awareness of combined, accumulating contaminants in Vermont waters and their toxicity has increased to the level of alarm:

- > Over 900,000 pounds of pesticides used in Vermont in 2020, of which an undetermined amount enters surface and groundwater;<sup>1</sup>
- > Hundreds of thousands of gallons of untreated sewage, containing per-and polyfluoroalkyl substances (PFAS), discharged from wastewater treatment facilities (WWTFs) and Combined Sewage Overflows (CSOs) -128,900 gallons from Rutland on July 18 alone -- in the Champlain Basin;<sup>2</sup>
- > Thousands of gallons of untreated toxic leachate from Vermont's sole landfill and from neighboring states discharged to WWTFs unable to process the heavy metals, PFAS or priority pollutants, which are released to the waters we all depend upon for life;<sup>3</sup>
- > Water and fish in the Winooski River, Otter Creek and Lake Memphramagog contaminated with PFAS, bioaccumulative and persistent toxins;<sup>4</sup>
- > EPA's revised notices about the toxicity of PFAS, lowering health advisory levels to near 0 for PFOA.<sup>5</sup>

It is doubly disturbing that Vermont laws and regulations allow this state of affairs to continue without questioning basic tenets of the Water Quality Standards such as assimilation and mixing zones.

The revision of these standards must now be based on the scientific realities of bioaccumulative toxins and their impacts on human health, on revised policies at the federal level regarding mixing zones, and on the fact that Earth and its hydrological cycle is a living, finite, and intimately inter-related system.

Comments on the Draft Water Quality Standards 2022.

#### §29A - 102 Definitions

p.5: #6. "Assimilative Capacity." This concept is questionable. It is directly related to mixing zones, and is a dangerous concept in the presence of PFAS and other endocrine disrupting compounds in waters.

p.6: #26. "Mixing zone." Given the presence of bioaccumulative toxins including PFAS, mixing zones must be *eliminated as soon as possible* from the Water Quality

Standards and Rules, in accordance with EPA's 2014 document.<sup>6</sup> *I urge your attention to the EPA 2014 document quoted below under §29A-204, Special Zones.*

p.9: #50. "Waste management zone." Has this mechanism been approved by EPA? Again, this term is dependent upon an outmoded concept of dilution as the solution to pollution. It supports the outmoded and wrongful practice of designating streams to carry off wastes, degrading "Waters of the State". See discussion below on Special Zones, §29A-204.

### §29A-103 General Policies p. 9 ff.

Our largest lakes are international waters. Once toxins are released into water, we cannot control where they go. Toxins can cause adverse health effects at very small concentrations (parts per trillion) as present in "dilution," causing immune dysfunction and endocrine disruption.

Many more people depend on the water now and suffer from more complex diseases including the current pandemic. The potential link between toxins and current illnesses cannot be dismissed. The burden of proof is intolerable without employing the Precautionary Principle.

The Clean Water Act was enacted to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters". Vermont's Water Quality Standards are developed "to protect and enhance the quality, character, and usefulness of its surface waters and to assure the public health".

*These goals cannot be achieved under the current assumptions and policies.*  
As long as you allow discharge of toxic wastes to waters, you will NOT "prevent degradation of high quality waters, [or] prevent, abate, or control all activities harmful to water quality; [or] provide clear, consistent, and enforceable standards for the permitting and management of discharges.

(b) 1: The goal to protect and enhance the quality, character, and usefulness of surface waters and to assure the public health is undermined by the serious disconnect from your policy of allowing discharge of essentially untreated landfill leachate and industrial wastes to municipal wastewater treatment facilities (WWTFs).

(b) 2: (2) (b) The goal to maintain the purity of drinking water is *ENDANGERED* by

- > allowing discharge of leachate to WWTFs;
- > allowing application of toxic sludge to farm fields;
- > continued discharges of untreated sewage from WWTFs contaminated with PFAS and pesticides;
- > failure to limit pesticide uses on farms and rights-of-way;
- > use of PFAS-contaminated pesticides to control mosquitos and aquatic nuisances.

In May 2021, Conservation Law Foundation (CLF) and Public Employees for Environmental Responsibility (PEER) wrote to ANR Sec. Julie Moore and VAAFM Sec.

Anson Tebbetts requesting that pesticides contaminated with PFAS not be used in mosquito control districts until an analysis assures the agencies that they are free of such contamination. They also requested that major pesticides used in Vermont be tested for PFAS contamination as soon as possible, due to their persistence, bioaccumulation and dangers to human and ecological health.<sup>7</sup>

How will DEC work with VAAF to protect human health from PFAS hidden in pesticides used in Vermont?

#### p.11. § 29A-104. Classification of Water Uses

If the waters of the hydrological cycle are all inter-related and Earth's life processes are inter-related, how can we allow some waters to be more toxic than others?

Thank you for including wetlands in these rules. It is high time they were included, as they are essential for guarding water quality, biological diversity and integrity.

The protection of wetlands must extend to establishing the permit process for use of herbicides at electric substations. See my comments to Misha Cetner on this issue regarding the NPDES PGP.

#### p.12. § 29A-105. Anti-degradation Policy

p. 13: (2) "A limited reduction in the existing higher quality of such waters may be allowed ... "

Here begins the degradation of waters. Permits allow degradation.

p. 13: (c) 3: "The analysis of alternatives required under subdivision (c)(2)(B) of this subsection shall evaluate a range of alternatives that would prevent or lessen the degradation associated with the proposed activity. *When the analysis identifies one or more practicable alternatives, the Secretary shall only find that a lowering is necessary if one such practicable alternative is selected for implementation.* For purposes of this section, "practicable" means technologically possible, able to be put into practice, and economically viable."

This paragraph, especially the text in italics, reveals that the *State is all too willing to allow degradation of water quality, to surrender water quality to economic and political pressures.* I find this paragraph a troubling piece of legal license to pollute the waters of life in Vermont. Is not the purpose of an anti-degradation policy to maintain water quality now and for the future?

Why doesn't this policy agree with § 29A - 206, regarding permits under the Clean Water Act?

#### § 29A-106 Discharge Policy

p.13. Clean Water Act. Appendix 5. Cumulative Effects - Abstract

The 404(b)(1) Guidelines, 40 CFR 230.1(c), address cumulative effects of each discharge of dredged or fill material on the aquatic ecosystem.<sup>8</sup>



What rules require consideration of cumulative effects of multiple discharges in surface waters including drugs; sewage effluent containing PFAS; pesticides used in cooling towers, agriculture, landscaping, highway and railroad rights-of-way, electric utility substations, aquatic nuisance, lamprey, and mosquito control?

How do these regulations enable us to ascertain the accumulation of toxins in waters in order to prevent degradation of waters?

p.17. § 29A-204 Special Zones.

Mixing zones. In 2014 EPA advised *against* using “mixing zones” in the presence of *bioaccumulative toxins*. I quote from EPA’s document <sup>6</sup>:

*“While **mixing zones serve to dilute concentrations of pollutants** in effluent discharges, they also allow increases in the mass loading of the pollutant to the waterbody (more so than would occur if no mixing zone were allowed). Therefore, if not applied appropriately, a mixing zone could adversely affect mobile species passing through the mixing zone as well as less mobile species (e.g., benthic communities) in the immediate vicinity of the discharge. Because of these and other factors, mixing zones should be applied carefully so that they do not result in impairment of the designated use of the waterbody as a whole or impede progress toward the CWA goals of restoring and maintaining the physical, chemical, and biological integrity of the Nation’s waters.*

*“States and tribes should conclude that mixing zones are not appropriate in the following situations:*

- Where they may impair the designated use of the waterbody as a whole.*
- Where they contain pollutant concentrations that may be lethal to passing organisms.*
- Where they contain pollutant concentrations that may cause significant human health risks considering likely pathways of exposure.*
- Where they may endanger critical areas such as breeding and spawning grounds, habitat for threatened or endangered species, areas with sensitive biota, shellfish beds, fisheries, drinking water intakes and sources, and recreational areas.*

*“Bioaccumulative pollutants are one example of a pollutant for which mixing zones may not be appropriate because they may cause significant human health risks such that the designated use of the waterbody as a whole may not be protected.*

***Therefore, the EPA recommends that state and tribal mixing zone policies do not allow mixing zones for discharges of bioaccumulative pollutants.***

*The EPA adopted this approach in **2000** when it amended its 1995 Final Water Quality Guidance for the Great Lakes System at 40 CFR Part 132 to **phase out** mixing zones for existing discharges of bioaccumulative pollutants within the Great Lakes Basin and **ban such mixing zones** for new discharges within the Basin.” (emphasis added).*

Have you seen this document? Please acknowledge receipt of this information.

EPA recognizes the physical connection between mixing zones and dilution, and cautions *against* their use in the presence of bioaccumulative toxins. (See EPA's new health advisory for PFOA, in drinking water as close to 0 ppt.<sup>9</sup>)

The number of mixing zones and waste management zones permitted in Vermont may approach 340, depending on how they are counted. The majority empty to Lake Champlain; approximately 100 to Connecticut River, approximately 10 to Lake Memphramagog and 10 to Hudson River.<sup>10</sup>

Your own report states that PFAS have been found in fish at levels of concern in the mouths of the Otter Creek and of the Winooski River. Since the water in the Main section of Lake Champlain (downstream of Otter Creek) is retained there for about three years, PFAS can accumulate in the lake, in fish, and contaminate the water for those who depend upon it for drinking water.

Contaminating waters with bioaccumulative toxins means environmental injustice for current and future generations, especially of poor and BIPOC people depending on rivers for food, water and recreation!

Given the information above, DEC must carefully re-examine and curtail the practice of using mixing zones in the revision of WQS 2022, as they can no longer be universally applied in our wastewater system where PFAS are present.

**P. 18 (b) (1) Designation:** "the Secretary may... designate a specific portion of the receiving waters as a **waste management zone** when criteria in subdivision (2) ...are met."

Criteria C,D. & E all represent risk and danger to human and ecological health, and degradation of waters of Earth Community. Waste management zones are highly questionable, subject to the same objections as mixing zones. See comments above. I urge that they also be severely curtailed and eliminated as soon as possible.

**p.20. Water Quality Criteria. §29A-302.**

"The following water quality criteria shall be achieved in waters, as specified below:"  
"(2) Phosphorus.

(A) "In all waters, total phosphorous loadings shall be limited so that they will not contribute to the acceleration of eutrophication or the stimulation of the growth of aquatic biota in a manner that prevents the full support of uses."

The annual budget for phosphorus (P) in VT waters must include the P contributed annually by 34,297 pounds (active ingredient) of glyphosate-based herbicides.<sup>1</sup> This is a potential contribution of 6276.4 lbs of P to VT waters. Glyphosate acid contains 18.3% phosphorus.<sup>10</sup> All contributions of P must be included in calculations of the TMDL for P and the allocation of the P budget.

**p.24. §29A-303. General Criteria applicable to all waters.**

(7) Toxic substances:

Questions: 1) How can this standard, "a maximum individual lifetime risk of no adverse effect to human health" be enforced or translated to the amount of toxins encountered in the water?

2) Why not change the measurement of toxins in water to Maximum Contaminant Level (MCL) in parts per billion?

p.28. § 29A-306 Use-specific Management Objectives and Criteria by Class.

While the State is willing to monitor waters more assiduously for toxins and their effects on selected biota, it is necessary for the State to *set and enforce standards, reduce* current pesticide use, and *prevent* discharges of toxins from WWTFs and CSOs, in order to protect the ecological and human health of Vermont from degradation. Monitoring is not enforcement or prevention.

p.43. Appendix B. DESCRIPTION OF LAKE CHAMPLAIN AND LAKE MEMPHREMAGOG SEGMENTS FOR APPLICATION OF PHOSPHORUS CRITERIA.

Scientists have established a causal link between the large use of glyphosate-based herbicides and excess phosphorus in surface waters.<sup>11</sup> It is time for state officials to include the use of glyphosate-based herbicides in the budget for P in TMDLs for our lakes. All contributions of phosphorus must be considered in the work to reduce P in VT waters. See also discussion of glyphosate-based herbicides above.

pp. 44-62. Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Appendix C must include standards for the following:

- \* per- and polyfluoroalkyl substances (PFAS) now regulated by VT Statute;
- \* diquat and diuron on EPA's list of hazardous substances;
- \* atrazine, glyphosate, diquat, diuron, metolachlor, and neonicotinoid insecticides, several of which are endocrine disruptors.

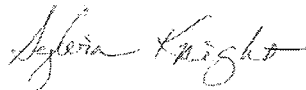
Neonicotinoid insecticides are considered harmless to humans, but humans are exposed through increasingly contaminated water and food. Fetal exposure to food contaminants occurs through the placenta. Thiacloprid, thiamethoxam and imidacloprid interact with and change hormones in the fetus and placenta necessary for successful development, a factor that must be considered in the relationship between environmental exposure and birth outcomes.<sup>12</sup>

While you are not responsible for toxicological standards, I urge you to be aware of the mechanisms and challenges of endocrine disruption, updated protocols of toxicology,<sup>13</sup> and their relationship to the very low levels of endocrine disrupting toxins currently allowed in surface waters that are very likely affecting public health in Vermont.

We are all engaged in a profound matter of environmental justice for all people, all times, and for the Earth's biosphere.

Thank you for your consideration of my comments on the Draft Water Quality Standards.

Sincerely,  
Sylvia Knight



References:

1. VAAFM (2020). 2020 Use by active ingredient (pounds)- Initial reporting.  
[https://agriculture.vermont.gov/sites/agriculture/files/documents/PHARM/Pesticides/usage/2020%20Statewide%20Usage%20Active%20Ingredients\\_initial.pdf](https://agriculture.vermont.gov/sites/agriculture/files/documents/PHARM/Pesticides/usage/2020%20Statewide%20Usage%20Active%20Ingredients_initial.pdf)
2. VT Agency of Natural Resources. See CSO reports ID# 6187, 6188, 6189, 6190.  
<https://anrweb.vt.gov/DEC/WWInventory/SewageOverflows.aspx>
3. VT DEC (2021). Pretreatment Discharge Permit #3-1406. New England Waste Services, Inc.  
[https://anrweb.vt.gov/Pubdocs/DEC/ENB/ENB\\_V2/13854-3-1406\\_DraftPermit.20210920.pdf](https://anrweb.vt.gov/Pubdocs/DEC/ENB/ENB_V2/13854-3-1406_DraftPermit.20210920.pdf)
4. VT Agency of Natural Resources (2022). 2021 Vermont Per- and Polyfluoroalkyl Substances (PFAS) Surface Water, Fish Tissue, and Wastewater Treatment Facility Effluent Monitoring Report.  
<https://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/2021-PFAS-Surface-Water-Fish-Tissue-and-WWTF-Effluent-Monitoring-Report.pdf>
5. EPA (2022). Technical Fact Sheet: Drinking Water Health Advisories for Four PFAS (PFOA, PFOS, GenX chemicals, and PFBS).  
<https://www.epa.gov/system/files/documents/2022-06/technical-factsheet-four-PFAS.pdf>
6. EPA. Water Quality Standards Handbook, Chap.5: General Policies (40 CFR 131.13)  
<https://www.epa.gov/sites/default/files/2014-09/documents/handbook-chapter5.pdf>
7. Duggan J and T. Whitehouse (2021). Letter to ANR Secretary Julie Moore and VAAFM Secretary Anson Tebbetts. Agency action needed to address PFAS contamination in pesticides.  
<https://www.clf.org/wp-content/uploads/2021/05/CLF-PEER-PFAS-in-Pesticides-Letters-2.pdf>
8. Clean Water Act. Appendix 5. Cumulative Effects.  
[https://www.epa.gov/sites/default/files/2015-05/documents/appendix\\_5\\_cumulative\\_effects\\_011311.pdf](https://www.epa.gov/sites/default/files/2015-05/documents/appendix_5_cumulative_effects_011311.pdf)
9. U.S.EPA (2022). Technical Fact Sheet: Drinking Water Health Advisories for Four PFAS (PFOA, PFOS, GenX chemicals, and PFBS). June 2022.  
<https://www.epa.gov/system/files/documents/2022-06/technical-factsheet-four-PFAS.pdf>
10. VT WW Mixing and WM Zones 20220708.xlsx.  
<https://mail.google.com/mail/u/0/#inbox?projector=1>
11. Hébert, MP, V. Fugere, and A. Gonzalez (2018). The overlooked impact of rising glyphosate use on phosphorus loading in agricultural watersheds. Front Ecol Environ 2018;  
[doi:10.1002/fee.1985](https://doi.org/10.1002/fee.1985)
12. Caron-Beaudoin E et al (2017). The use of a unique co-culture model of fetoplacental steroidogenesis as a screening tool for endocrine disruptors: The effects of neonicotinoids on aromatase activity and hormone production. Toxicology and Applied Pharmacology 332 (2017) 15-24. <https://doi.org/10.1016/j.taap.2017.07.018>
13. Birnbaum, Linda (2012). State of the Science of Endocrine Disruptors.  
[doi:10.1289/ehp.1306695](https://doi.org/10.1289/ehp.1306695)

**From:** [James Ehlers](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [Elizabeth Ehlers](#); [sknightinv73](#)  
**Subject:** Comments on Draft WQS 2022  
**Date:** Friday, July 22, 2022 3:45:39 PM  
**Attachments:** [DraftWQS2022-Comments-072122.pdf](#)

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Miss Sargent,

Lake Champlain International supports the comments and questions submitted by Ms. Knight and looks forward to your response.

Thank you.

James Ehlers  
Policy Director, Lake Champlain International

----- Forwarded message -----

**From:** **Sylvia Knight** <[sknightinv73@gmail.com](mailto:sknightinv73@gmail.com)>  
**Date:** Fri, Jul 22, 2022 at 10:25  
**Subject:** Comments on Draft WQS 2022  
**To:** Sargent, Bethany <[Bethany.Sargent@vermont.gov](mailto:Bethany.Sargent@vermont.gov)>

Dear Bethany,

My comments on the Draft WQS 2022 are attached. Please remember, as you review comments from me and others, that we live downstream from and use the water contaminated by many uses permitted by the rules your department promulgates in an unequal process.

Seeking justice for all,

Sylvia Knight

Earth Community Advocate & Researcher

Burlington, VT 05408

[sknightinv73@gmail.com](mailto:sknightinv73@gmail.com)

pronouns: she, her

We cannot solve our problems with the same thinking we used when we created them. Albert Einstein.

"We aren't going to have peace on Earth until we recognize the basic fact of the interrelated structure of all reality."

Martin Luther King, Jr.

**From:** [Annette Smith](#)  
**To:** [Sargent, Bethany](#); [LaFlamme, Pete](#)  
**Subject:** Vermont Water Quality Standards/Rules for Vermont  
**Date:** Friday, July 22, 2022 11:49:36 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Bethany and Pete,

Vermonters for a Clean Environment supports and hereby incorporates the comments of Sylvia Knight regarding the update to Vermont's Water Quality Standards.

Thank you.

Annette

Annette Smith  
Executive Director  
Vermonters for a Clean Environment  
789 Baker Brook Road  
Danby, VT  
(802)446-2094  
[vce@vce.org](mailto:vce@vce.org)

July 22, 2022

Bethany Sargent  
Program Manager, Monitoring and Assessment Program  
Agency of Natural Resources  
Department of Environmental Conservation  
Watershed Management Division  
1 National Life Drive, Davis 3  
Montpelier, VT 05620-3533  
[bethany.sargent@vermont.gov](mailto:bethany.sargent@vermont.gov)

Hannah Smith  
Staff Attorney  
Agency of Natural Resources  
Department of Environmental Conservation  
Watershed Management Division  
1 National Life Drive, Davis 3  
Montpelier, VT 05620-3533  
[Hannah.smith@vermont.gov](mailto:Hannah.smith@vermont.gov)

*by e-mail:* [bethany.sargent@vermont.gov](mailto:bethany.sargent@vermont.gov); [hannah.smith@vermont.gov](mailto:hannah.smith@vermont.gov)

**Re: Comments on the Proposed Vermont Water Quality Standards Rule**

Dear Bethany and Hannah:

Lake Champlain Committee, Connecticut River Conservancy, Conservation Law Foundation, and Vermont Natural Resources Council appreciate the opportunity to submit the following comments on the proposed revision-amendments to the 2017 Vermont Water Quality Standards (VWQS). We are especially grateful to the Vermont Agency of Natural Resources' Department of Environmental Conservation (DEC or Department) for the extensive stakeholder input process prior to the release of the Draft Rule, as well as the opportunity to comment in the formal rulemaking process.

Our comments on the proposed VWQS Draft Rule (Draft Rule) include both narrative explanations and specific in-text recommended edits. Should the Department experience any confusion regarding these comments or their organization, we remain available to discuss and clarify at any time. We appreciate the Department's consideration of these comments.

**GENERAL COMMENTS**

**A. The Need for Monitoring Pesticides in Vermont's Surface Waters**

As we have historically commented, our organizations continue to urge the Agency of Natural Resources (ANR) and Department to proactively implement water quality sampling and monitoring practices for pesticides in surface waters throughout the State. Although the Agency

of Agriculture, Food & Markets (AAFM) is specifically charged under 6 V.S.A. Chapter 87 and the Vermont Regulations for Control of Pesticides with the majority of regulatory-pesticide-related tasks including pesticide registration, licensing, certificates, and certain permitting programs (among other responsibilities under the regulations), ANR and the Department also have a critical role to play in ensuring the minimization of pesticides on non-target organisms, surface waters, and the environment-at-large.

The Department's National Pollutant Discharge Elimination System (NPDES) Pesticide General Permit (PGP) relating to discharges from the application of pesticides to waters of the State is an excellent regulatory example of the important interplay between pesticide application, water quality, and the Department's role in ensuring that impacts from the pesticides applied on, or over, surface waters are minimized.<sup>1</sup> Increased water quality sampling and monitoring by the Department will both help inform staff on pesticide applications—which may, or may not, have existing coverage under the PGP—and allow the Department to effectively coordinate and inform AAFM of pesticide applications impacting waters of the State, all of which provides additional protections to the environment and the health of Vermonters.

Related, as we discuss in further detail below under Section B, there is an increasing amount of scientific research being published about the presence of per- and polyfluoroalkyl substances (PFAS) in pesticides, and subsequently surface waters.<sup>2</sup> On October 5, 2021, Conservation Law Foundation and Public Employees for Environmental Responsibility (PEER) sent a letter to department commissioners and agency secretaries across New England—including leadership in Vermont—notifying them of the alarmingly high concentrations of PFAS in pesticides products registered and used in every New England state and the need for protective state responses, including water quality testing in surface waters, as well as pesticide product testing.

More recently, the Environmental Protection Agency (EPA) notified industries about fluorinated high-density polyethylene (HDPE) products, including pesticide storage containers, and the linkage for PFAS to form and migrate from HDPE items.<sup>3</sup> Relevant here, as an example in Vermont, a close look at the Otter Creek Watershed Insect Control District's (OCWICD) historic and current adulticide applications in the towns of Brandon, Leicester, Salisbury, Goshen, Pittsford, and Proctor reveals a strong likelihood of the presence of PFAS in the pesticides that

---

<sup>1</sup> See e.g. STATE OF VERMONT, AGENCY OF NATURAL RESOURCES, DEPT. OF ENV. CONSERVATION, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PESTICIDE GENERAL PERMIT 9 (July 15, 2022), [https://dec.vermont.gov/sites/dec/files/wsm/lakes/PGP/VT\\_NPDES\\_PGP\\_2022.pdf](https://dec.vermont.gov/sites/dec/files/wsm/lakes/PGP/VT_NPDES_PGP_2022.pdf) (specifying a under section 3.1 that all Operator's "must minimize the discharge of pesticides to waters of the State . . .").

<sup>2</sup> See e.g. Press Release, Env't Prot. Agency, EPA Releases Testing Data Showing PFAS Contamination from Fluorinated Containers (Mar. 5, 2021), <https://www.epa.gov/newsreleases/epa-releases-testing-data-showing-pfas-contamination-fluorinated-containers>; Letter from Tala R. Henry, Deputy Director, Office of Pollution Prevention & Toxics, U.S. Env't Prot. Agency, to Manufacturers, Processors, Distributors, Users, & Those that Dispose of Fluorinated Polyolefin Containers (Mar. 24, 2022), [https://www.epa.gov/system/files/documents/2022-03/letter-to-fluorinated-hdpe-industry\\_03-16-22\\_signed.pdf](https://www.epa.gov/system/files/documents/2022-03/letter-to-fluorinated-hdpe-industry_03-16-22_signed.pdf); see also Env't Prot. Agency, EPA Announces New Drinking Water Health Advisories for PFAS Chemicals, \$ Billion in Bipartisan Infrastructure Law Funding to Strengthen Health Protections (June 15, 2022), <https://www.epa.gov/newsreleases/epa-announces-new-drinking-water-health-advisories-pfas-chemicals-1-billion-bipartisan>.

<sup>3</sup> See Press Release, Env't Prot. Agency, EPA Releases Testing Data Showing PFAS Contamination from Fluorinated Containers (Mar. 5, 2021), <https://www.epa.gov/newsreleases/epa-releases-testing-data-showing-pfas-contamination-fluorinated-containers>.



have been, and are currently being applied, which may make their way to waters of the State. Pesticide applications by OCWICD include roadside spraying of Permanone<sup>4</sup>, a permethrin-based adulticide which in 2021 was found to be contaminated with PFAS.<sup>5</sup>

Importantly here, PFAS is merely one of many harmful contaminants in pesticides, which have the potential to negatively impact the State's surface waters—supporting our recommendation that the Department perform sampling, monitoring, and testing for pesticides in surface waters. To this end, we fully understand that water quality sampling and analysis for pesticides in surface waters across the entire State is likely cost prohibitive. In response, however, we recommend that the Department develop a prioritization methodology to assess which pesticides applied in Vermont are likely to appear in the State's waters at potentially harmful levels, based on use patterns, chemistry, fate, transport, etc. With this, by example, the Department could monitor for the most heavily applied pesticides, like glyphosate-related products, in the surface waters of large agricultural regions, for example, Otter Creek and Lewis Creek in Addison County and the Missisquoi River in Franklin County. Akin to PEER's research on the presence of PFAS in pesticides, the U.S Geological Survey's (USGS) recent surface water sampling analysis and results performed in Chittenden and Franklin Counties revealing a host of alarming levels of pesticide compounds further underscores the urgency for the Department to perform sampling and testing.<sup>6</sup>

## B. Taking Bold Action on PFAS

Over the past few decades per- and polyfluoroalkyl substance contamination has risen into a global health crisis. Indeed, the ongoing research reveals that PFAS is toxic to humans in very small concentrations—in the *parts per trillion*.<sup>7</sup> Alarming, we know that humans are exposed to numerous PFAS chemicals on a daily basis ranging from drinking water, air, food, dust, carpets, furniture, personal care products, clothing, and more.<sup>8</sup> PFAS chemicals are a public

---

<sup>4</sup> OCWICD applied 103.7 gallons of Permanone in 2020, and an unknown proportion of Permanone in 710.7 gallons of “Permanone/Permasease” in 2021 according to their annual reports published with each town in the District. See TOWN OF SALISBURY ANNUAL REPORT, FISCAL YEAR ENDING JUNE 30, 2021 38–39 (February 2022), [https://www.townofsalisbury.org/vertical/sites/%7B59D8C83C-9968-4A65-BB2B-00DE19899066%7D/uploads/FY\\_2021\\_Town\\_Report.pdf](https://www.townofsalisbury.org/vertical/sites/%7B59D8C83C-9968-4A65-BB2B-00DE19899066%7D/uploads/FY_2021_Town_Report.pdf); see also TOWN OF SALISBURY ANNUAL REPORT FISCAL YEAR ENDING JUNE 30, 2020 32 (February 2021), [https://www.townofsalisbury.org/vertical/sites/%7B59D8C83C-9968-4A65-BB2B-00DE19899066%7D/uploads/FY20\\_Salisbury\\_Town\\_Rpt\\_v4.pdf](https://www.townofsalisbury.org/vertical/sites/%7B59D8C83C-9968-4A65-BB2B-00DE19899066%7D/uploads/FY20_Salisbury_Town_Rpt_v4.pdf).

<sup>5</sup> See e.g., Press Release, March 24, 2021, Public Employees for Environmental Responsibility, PFAS Found in Widely Used Insecticide, <https://peer.org/pfas-found-in-widely-used-insecticide/>.

<sup>6</sup> See SERENA MATT, U.S. GEOLOGICAL SURVEY, SYNOPTIC STUDY OF GLYPHOSATE, NEONICOTINOIDS, AND SELECTED OTHER PESTICIDES IN STREAMS DRAINING TO LAKE CHAMPLAIN FROM URBAN AGRICULTURAL SOURCES NEAR BURLINGTON, VERMONT, 2021 (JUNE 10, 2022), <https://www.sciencebase.gov/catalog/item/627954a8d34e8d45aa6e3c0a> (highlighting results from a study designed to measure concentrations of glyphosate, aminomethylphosphonic acid (AMPA, a product of glyphosate degradation in the environment), and several neonicotinoids in selected urban and agricultural streams located in the Lake Champlain Basin of Vermont that was conducted in the spring, summer, and fall of 2021).

<sup>7</sup> *Per- and Polyfluoroalkyl Substances (PFAS) and Your Health*, AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY (last accessed June 20, 2022), <https://www.atsdr.cdc.gov/pfas/health-effects.html>; U.S. DEP'T HEALTH & WUMAN SERV. AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, TOXICOLOGICAL PROFILE FOR PERFLUOROALKYLS 5–6 (May 2021), <https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf>.

<sup>8</sup> ANNA READE AND KATHERINE PELCH, NATURAL RESOURCES DEFENSE COUNCIL, TECHNICAL COMMENTS TO VERMONT AGENCY OF NATURAL RESOURCES RE: ADVANCE NOTICE ON THE REGULATION OF PERFLUOROALKYL,

health perfect storm because they are (1) toxic in small concentrations; (2) persistent in the environment; (3) bioaccumulative; (4) highly mobile in water; (5) used in hundreds of different industrial and commercial processes and found in a wide variety of consumer products; and (4) there are over 9,000 different kinds of these dangerous chemicals.<sup>9</sup>

Moreover, PFAS have been found at unsafe levels in the environment throughout Vermont, including in more than 100 public water supplies, private drinking water wells, groundwater, and surface waters. In addition to the Vermont-regulated PFAS (PFOA, PFOS, PFHxS, PFHpA, PFNA), at least the following PFAS are present in Vermont: PFBA, PFPeA, PFHxA, PFDA, PFUnA, PFDaA, PFTA, PFTrDA, PFBS, PFPeS, PFHpS, PFDS, PFDoS, PFOSA, HFPO-DA or GenX, PFNS, NtFOSAA, NMeFOSSA; 4:2 FTS, 6:2 FTS, and 8:2 FTS.<sup>10</sup> This most likely does not reflect all PFAS present in the State due to limited testing.

Although PFOA and PFOS have now been phased out of production in the United States,<sup>11</sup> these compounds will remain in our drinking water, groundwater, and surface waters, as well as our bodies, for decades. In addition, manufacturers have rushed to produce thousands of alternative PFAS that are likely to pose comparable health risks given the similarities in chemical structure.<sup>12</sup>

Our organizations commend ANR and the Department for their hard work to-date on working to tackle the PFAS crisis. Indeed, significant steps forward have been taken to identify, enforce, and clean up contaminated PFAS sites, in addition to thoughtfully considering necessary regulatory actions to address the significant risks posed by PFAS. However, a lot of work remains, and time is of the essence—especially regarding the impacts of PFAS on Vermont’s surface waters and water quality.

To this end, we believe it is critical that the Agency and Department take action now to address PFAS in surface waters because EPA has failed to protect the public from these dangerous chemicals for decades and has still not committed to take meaningful action despite widespread contamination of drinking water, groundwater, and surface water. For instance, after becoming aware of contamination of drinking water supplies and the significant health risks posed by these dangerous chemicals, EPA gave manufacturers nearly a decade to phase out production and use of PFOA and PFOS through a voluntary program.<sup>13</sup> And even though EPA issued a PFAS Action

---

POLYFLUOROALKYL SUBSTANCES (PFAS) AS A CLASS 1 (November 16, 2020) [hereinafter NRDC Technical Comments].

<sup>9</sup> See *Per- and Polyfluoroalkyl Substances (PFAS) and Your Health*, AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, <https://www.atsdr.cdc.gov/pfas/overview.html>.

<sup>10</sup> NRDC Technical Comments, *supra* note 8, at 3.

<sup>11</sup> *Assessing and Managing Chemicals under TSCA, Fact Sheet: 2010/2015 PFOA Stewardship Program*, U. S. ENVTL. PROTECTION AGENCY, <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/fact-sheet-20102015-pfoa-stewardship-program#what>.

<sup>12</sup> See, e.g., NRDC Technical Comments, *supra* note 8, at 1, 5–6; Carol F. Kwiatkowski et al., *Scientific Basis for Managing PFAS as a Chemical Class*; Stephen Brendel et al., *Short-chain perfluoroalkyl acids: environmental concerns and a regulatory strategy under REACH*, 30 ENVTL. SCI. EUR. 1, 3–4 (2018), [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5834591/pdf/12302\\_2018\\_Article\\_134.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5834591/pdf/12302_2018_Article_134.pdf).

<sup>13</sup> See, e.g., Consent Order, *In the matter of: Dupont Company*, (Nos. P-08-508 and P-08-509, U.S. E.P.A. Office of Pollution Prevention and Toxics, April 9, 2009), available at <https://assets.documentcloud.org/documents/2746607/Sanitized-Consent-Order-P08-0508-and-P08-0509.pdf>;

Plan in 2019, the Action Plan fails to make any commitment to developing enforceable regulatory standards for PFAS. In the case of surface water standards in particular, EPA only commits to “[d]etermine if available data and research support the development of Clean Water Act Section 304(a) ambient water quality criteria for human health for PFAS” by 2022.<sup>14</sup> If EPA only completes this data review by the end of this year, there is very little likelihood that ANR could launch and complete a regulatory process to establish standards by 2024, especially given EPA’s slow track record of standard development.

Considering EPA’s failure to act over decades to protect the public from these dangerous chemicals—and its failure to commit to creating standards in its PFAS Action Plan—states must promptly establish surface water standards for the PFAS class or subclasses. ANR has broad authority to protect surface water,<sup>15</sup> and the legislature specifically directed the Agency to promulgate new rules to better protect Vermonters from the PFAS class of chemicals.<sup>16</sup>

We strongly urge the Agency not to wait until the legislative deadline of 2024 to develop surface water standards (even if the standards must later be updated). Indeed, there is sufficient data available now for ANR to at least establish surface water standards for PFOA and PFOS, and to establish an upper limit for the entire class of PFAS chemicals that protect human health, aquatic life and designated uses. In that same vein, we encourage ANR and the Department to require increased monitoring for PFAS—at a minimum including the PFAS listed under ANR’s drinking water standards including PFOA, PFOS, PFHxS, PFHpA, and PFNA—and required testing as part of any ANR National Pollutant Discharge Elimination System (NPDES) issued permits. In sum, we urge the Agency not to delay in adopting surface water standards and water quality criteria for PFAS chemicals where adequate data and scientifically-defensible methods from other comparable states exists. The risk to human health, aquatic life, and designated uses exists today and must be addressed.

## SECTION-BY-SECTION COMMENTS

### C. Subchapter 1. Applicability, Definitions, and Policies

#### a. § 29A-101 Applicability

§ 29A-101(b) – We support the changes proposed regarding the vesting of applications from the time an application for a permit or certification is filed to the time when the final administrative action is taken. This will ensure that all proposed permitted projects comply with the Clean Water Act and the current Vermont Water Quality Standards, rather than an outdated regulation.

---

Premanufacture Notification Exemption for Polymers; Amendment of Polymer Exemption Rule to Exclude Certain Perfluorinated Polymers, 75 Fed. Reg. 4295, 4296 (Jan. 27, 2010).

<sup>14</sup> Per- and Polyfluoroalkyl Substances (PFAS) Action Plan 6, EPA (Feb. 2019), [https://www.epa.gov/sites/production/files/2019-02/documents/pfas\\_action\\_plan\\_021319\\_508compliant\\_1.pdf#page=61](https://www.epa.gov/sites/production/files/2019-02/documents/pfas_action_plan_021319_508compliant_1.pdf#page=61).

<sup>15</sup> 10 V.S.A. Chapter 47.

<sup>16</sup> An Act Relating to the Regulation of Polyfluoroalkyl Substances in Drinking and Surface Waters, Act 21 (2019) [hereinafter Act 21 (2019)], § 5.

§ 29A-101(c) – Under this subsection, we also support the addition of “[t]hese rules shall apply to wetlands as articulated in Sections §§ 29A-104(e) and 29A-105(e)” to specifically protect the functions and values of Class I and II wetlands.

**b. § 29A-102 Definitions**

§ 29A-102(53) – While we acknowledge that the definition of “Wetland” under the Draft Rule corresponds with other Vermont regulations and statutes, we maintain our long-standing objection to the exclusion of wetlands in agricultural lands used to “grow food or crops in connection with farming activities.” All lands that show or have shown the functions and values of wetlands should be considered jurisdictional wetlands under the purview of the Department. This is especially important with the onslaught of climate change and the need to increase the State’s resiliency abilities, especially given the vital ecosystem role that wetlands play.

**c. § 29A-103 General Policies**

i. § 29A-103(e) Tactical Basin Planning.

We ask that the Department continue to recommend reclassification of State waters, as indicated under § 29A-103(e)(4) of the Draft Rule, in addition to also requiring the initiation of rulemaking upon completion of a Tactical Basin Plan as established under § 29A-103(e)(5).

Under § 29A-103(e)(5) of the Draft Rule, the language as written indicates that the Secretary “shall” initiate rulemaking for recommendations made in the Tactical Basin Plans. However, to our knowledge, this policy has not been historically followed. This is particularly troublesome in regard to recommendations for the reclassification of State waters from B(2) to B(1) for fishing and/or for aquatic biota, and to A(2) and A(1) waters. The failure to initiate rulemaking leaves those waters without needed protections to maintain their chosen water quality classifications.

In response, we propose the following language to clarify and simplify:

(5) Upon adoption of a tactical basin plan, the Secretary shall promptly initiate rulemaking ~~and shall give due consideration to~~ on the recommendations contained in the tactical basin plan.

Finally, in an effort to assist with climate resilience preparations in the State, we suggest adding a new subsection (6) to § 29A-103(e):

(6) So that tactical basin plans help to advance Vermont’s goals for natural disaster-preparedness, climate resilience, and habitat management, the Secretary shall make recommendations pursuant to the State Hazard

Mitigation Plan and Vermont Conservation Design, and, shall coordinate with the following: the Director of Vermont Emergency Management; the Commissioner of the Fish and Wildlife Department; and the Commissioner of the Department of Forests, Parks, and Recreation.

ii. § 29A-103(f) Hydrology Policy.

It is important that any use of surface waters comply with the Vermont Water Quality Standards, including the use of surface waters for the generation of electricity. Like any other use, hydroelectric generation cannot degrade the waters of the State that it utilizes. Because of this, we support the removal of “to the extent practicable” in § 29A-103(f)(1) of the Draft Rule and the removal of “in achieving voluntary agreements relating to artificial streamflow regulation that” under § 29A-103(f)(2), as every effort must be made to ensure that water quality and water quantity are not degraded by power generation, even if these efforts have an economic impact on the utility.

**d. § 29A-104 Classification of Water Uses**

i. § 29A-103(d) Designated Uses.

We support the Department’s decision not to include hydroelectric generation as a designated use as was suggested by some stakeholder groups. The VWQS are intended to protect water quality for specific uses that rely on high quality water, such as protection of aquatic habitat and biota, and to protect public health. The generation of electric power is a commercial use that does not rely on high quality water, and in many instances degrades water quality by changing the physical, chemical, and thermal conditions of the water utilized. It is contrary to the purpose of the VWQS to protect a use that degrades water quality and thereby impairs other designated uses, particularly aquatic biota and habitat.

For this reason, we also urge the Department to remove the following under § 29A-103(d)(8): “[t]he use of water for irrigation of crops and other agricultural uses.” Akin to the generation of electric power, the growing of agricultural crops and the vague catch-all “other agricultural uses,” are commercial ventures. Like hydropower, irrigation does not necessarily rely on high quality water as other uses, such as aquatic biota and habitat, require it. Further, also resembling hydropower, agricultural uses can result in the degradation of water quality, in this case through the discharge of nutrient pollution. Accordingly, irrigation for agriculture should not be afforded the same level of protection as aquatic biota or other uses and § 29A-103(d)(8) should be removed from the list of designated uses.

**e. § 29A-105 Antidegradation Policy**

As we have commented throughout the discussions on the proposed changes to the VWQS, we recommend that the Department make changes to the section of the Antidegradation Policy that addresses existing uses to reflect the Vermont Supreme Court’s holding in *In re Morrisville Hydroelectric Project Water Quality*, 211 Vt. 233 (2019). Specifically, the Court in *Morrisville* rejected the argument that hydroelectric facilities are protected uses under the VWQS that could degrade waters and harm water quality and aquatic habitat.<sup>17</sup>

The *Morrisville* case also highlighted the lack of clarity in § 29A-105(b), Protection and Determination of Existing Uses, under the Antidegradation Policy of the Draft Rule. Specifically, §29A-105(b)(4) which specifies that “[t]he use of water for public water source or commercial activity that depends directly on the preservation of an existing high level of water quality . . .” caused particular confusion, especially regarding what constitutes a “commercial activity that depends directly on the preservation of an existing high level of water quality.”<sup>18</sup>

In *Morrisville*, the applicant argued that hydroelectric facilities rely on high quality water and, therefore, they should be allowed to operate in a manner that degrades water quality.<sup>19</sup> While the Court flatly rejected this argument, as long as the provision remains in the VWQS it will continue to create confusion.<sup>20</sup>

Accordingly, we recommend that the Department amend that provision with the following language for § 29A-105(b)(4): “*The use of the water for public water source., or commercial activity that depends directly on the preservation of an existing high level of water quality; and . . .*”

In addition, we recommend the Department clarify the Antidegradation Policy to ensure that no activity may degrade water quality, or aquatic habitat, without complying with Antidegradation Policy—including actions to protect existing uses.

Finally, we reserve further comments on this particular section of the Draft Rule because of the current intensive stakeholder process that is taking place on this policy, as well as anticipated rulemaking later this fall.

**f. Subchapter 2. Application of Standards**

- i. § 29A-206 Water Quality Certifications Issued Pursuant to § 401 of the Clean Water Act.

---

<sup>17</sup> *In re Morrisville Hydroelectric Project Water Quality*, 211 Vt. 233, 252 (2019).

<sup>18</sup> *Id.* at 239; *see also* AGENCY OF NATURAL RESOURCES, VERMONT WATER QUALITY STANDARDS § 1-01(B)(18) (2014).

<sup>19</sup> *Id.* at 252.

<sup>20</sup> *Id.* at 252–53.

We support DEC's decision to include this clarifying language and a more structured and transparent process for noticing draft 401 water quality certificates.

**g. Appendix F – Water Quality Classifications**

The general reader who reviews the Draft Rule may not understand that the charts for Appendix F on pages 68 through 93 indicate changes in classification for specific designations. We suggest that the Department write a short explanatory paragraph before this chart to explicitly state that the waters in the chart(s) outline changes in those water bodies such that they do not neatly fall under section (b) or (c) of the Draft Rule's appendix.

**CONCLUSION**

As we enter the era of climate change and shifting demands, it is vital that Vermont secure and implement forward thinking protective management regulations for surface water quality to ensure the safety and health of our communities, natural resources, and environment at-large. Updates to bedrock protective regulations—including the Draft Rule at issue in these comments—that are informed by the best available science and policy is imperative as we attempt to strengthen the State's resiliency abilities. For these reasons, we appreciate the opportunity to submit these comments, and for your thoughtful attention to this matter. Our organizations remain available to discuss the issues in the comments at any time.

Respectfully submitted,

July 22, 2022

/s/ Lori Fisher

Executive Director  
Lake Champlain Committee

/s/ Kathy Urffer

River Steward, Vermont/New Hampshire  
Connecticut River Conservancy

/s/ Jon Groveman

Policy and Water Program Director  
Vermont Natural Resources Council

/s/ Karina Dailey

Restoration Ecologist  
Vermont Natural Resources Council

/s/ Mason Overstreet

Staff Attorney  
Conservation Law Foundation Vermont



Great River Hydro

MEMORANDUM

TO: Bethany Sargent, Program Manager  
VT Department of Environmental Conservation  
Watershed Management Division, Monitoring and Assessment Program

FROM: John Ragonese, FERC License Manager, Great River Hydro, LLC

DATE: July 22, 2022

RE: Proposed changes to the VT Water Quality Standards

---

Bethany,

Thank you for the opportunity to provide comments on the Proposed VT Water Quality Standards Rule. As you know I previously provided “pre-rulemaking” comments on April 23, 2021. I appreciate the VT Department of Environmental Conservation consideration of those comments and in particular the changes made to the original draft rule (04/2021) that addressed several of them, in part at least.

I wish to reiterate several important points from my April 2021 comment memo provided during the pre-rulemaking stakeholder outreach that remain unaddressed.

Again, thank you for the opportunity to provide further comment on the proposed rules and trust you will consider or re-consider them before final rule-making.

John

**§ 29A-102 Definitions (33) and (43)**

- Including "portion of the riparian corridor that support woody debris recruitment and temperature refuge" into the definition of Physical Habitat Structure suggests the rules will govern these “portions” of the riparian corridors, yet there is no basis for that or any suggested rulemaking to do so. So why include portions of riparian corridor in the definition?
- Physical habitat is referenced throughout the rule in terms of management objectives and criteria for determining Water Quality Classification. While I cannot find any sort of direct regulatory requirements applied to the riparian area under the rules, it suggests expansion of criteria to out of stream characteristics. It not only conflicts but confuses/complicates the application of other definitions such as Flow Characteristics (16), which refers to physical habitat structure –



where in this instance, clearly is limited to in-stream flow characteristics not riparian.

- Adding this to the definition of Physical Habitat Structure clearly expands the present spatial scope far outside of in-stream areas, streambanks, woody debris above the stream bed as live or dead vegetation within a riparian area that could add to instream debris or provide temperature moderating capability could encompass vegetation as far as 150 feet from the actual stream.
- Adding this phrase to these definitions is unnecessary, is already included within the riparian policy, creates confusion and inherently conflicts with the in-stream or jurisdictional wetlands scope of the Clean Water Act or 401 authority.

### § 29A-103(f)(2) Hydrology Policy

- By deleting the phrase, “*to the extent practicable*”, it suggests that there is always a means of determining conditions which preserve the natural flow regime of waters. GRH acknowledges that is the goal but as a policy, it must recognize that cannot always be achieved and therefore we strongly recommend the phrase remain in the policy statement. Sometimes it is simply not possible to restore to natural flow regime; perhaps close but not absolute and therefore the phrase “*to the extent practicable*” is necessary. Including it reflect reality, and does not create any sort of loop-hole. As stated, it acknowledges the need for flexibility when addressing complex streamflow systems that, in some cases, stray from a pure natural flow regime but benefit designated uses and maintain or expand biological integrity.
- For the same reason, GRH believes it is important to recognize there are circumstances when artificial streamflow regulation is a necessary reality that cannot be totally eliminated. The continued use of the word “*cooperating*” in the same sentence recognizes the need for a degree of case specific flexibility. Policy is not the same as a goal and it has to be grounded and reflect the landscape it applies to.

### § 29A-105(b) and (b)(6) Antidegradation Policy

- GRH is concerned about the additions to this Section.
- In reference to the proposed modified (in bold)sentence, “*In determining the existing uses to be protected and maintained under this section and all other sections of these rules, the Secretary shall consider **the designated uses of the water, and at least the following factors:***”, GRH would like to understand the purpose and meaning behind specifying [adding], “*the designated uses of the water, and*”. The factors which are already listed under § 29A-105(b)(1-5) appear to represent designated uses. If so, why the need to also add “*the designated uses of the water, and*” as if they were distinct and different.
- GRH encourages the Department to clarify the distinction between existing uses and designated uses.
  - GRH considers a water withdrawal or hydro project that exists or previously existed on or after November 28, 1975 to meet the criteria as an Existing Use and therefore the title of (b) Protection and Determination of Existing Uses is misleading. Rather this sub-section is about determining

the level or degree of protection existing uses are warranted, not determining whether they exist or not. Existence is defined by the definition and this sub-section states *“those existing uses shall be maintained and protected regardless of the water’s classification”*. The changes made in subsection (b) suggest they might not be protected and therefore is counter to the first sentence. GRH suggests the language be modified to read, *“In determining the extent to which existing uses will ~~to~~ be protected and maintained under this section and all other sections of these rules, the Secretary shall consider the designated uses of the water, and at least the following factors:...”*

- GRH further recommends the last item proposed for **addition**, *“When existing uses are incompatible, or conflict with designated uses, conditions shall be imposed to attain the water quality necessary to support the highest and best use.”* be modified to read, *“When existing uses **appear** ~~are~~ incompatible, or **appear to** conflict with designated uses, conditions shall be imposed to attain the water quality necessary to support designated use without eliminating the existing use which must also be maintained and protected of the highest and best use.”* This will maintain consistency with the first sentence in sub-section (b), eliminate the confusion and undefined term highest and best use, and provide for a realistic yet flexible approach needed in conflicting situations.

#### **§ 29A-206(e) Water Quality Certifications Issued Pursuant to §401 of the Clean Water Act**

- GRH sees value in listing potential State laws that could potentially apply to an activity requiring a Water Quality Certification.
- Regarding the language: *“Any certification issued by the State shall establish conditions necessary to ensure that the federally licensed or permitted activity will comply with these rules, as well as with any other appropriate requirement of state law, including:”*
  - Is this addition suggesting the provisions or permits necessary to comply with these state laws will be issued under a single WQC?
  - Given the fact that some of these laws might not apply, it would make sense to also add the following identified text to the proposed addition, *“Any certification issued by the State shall establish conditions necessary to ensure that the federally licensed or permitted activity will comply with these rules, as well as with any other appropriate requirement of state law, as applicable, including:”*
  - The WQC application should be revised so that the applicant can identify those laws and regulations that would apply, as well as those that do not.

#### **§ 29A-305 (a) Numeric Biological Indices and Aquatic Habitat Assessments**

- Adding language that requires an Applicant to obtain Secretary approval of a study in this Section is problematic.
- GRH performs, and hydro relicensing in general often requires, numerous studies under the Integrated Licensing Process as a means of having all the necessary study requirements and studies performed in advance of a FERC application and therefore in advance of the 401 process. Study plans are developed, agencies and stakeholders such as the Department comment and make recommendations for

changes, applicants often adjust to address those concerns and ultimately FERC determines what studies are necessary and they are performed. Results are reviewed by agencies such as the Department and comments are addressed. If the study scope was not followed studies are potentially redone or continued. All of this is done in advance of a 401 WQC application. To specify that after all of that, the Secretary may not approve those studies is very problematic for those situations. Therefore, we strongly recommend not adding the sentence, “Applicants shall obtain the Secretary’s approval of study plans prior to conducting an evaluation” as the studies would have already been performed according to a study scope developed in consultation with Department staff.

- Similarly, in § 29A-304 Hydrology Criteria (c)(2) the existing sentence, “*The Secretary need not consider any flow study unless the study plans have obtained the Secretary’s approval*” Is equally problematic from a timing and process standpoint given the situation described above and could result in a denial long after study scope, plans and execution have taken place.
- Replacement of the word “*may*” with “*shall*” is not a problem for GRH as long as it is clear that this is specific to determining whether or not the results of the studies provide adequate proof of “full support of aquatic habitat use” and does not pertain to whether or not the Secretary has approved the studies.

**From:** [Meg Berlin](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Citizen comment - Formal Comment on the new Water Quality Standards/Rules for Vermont.  
**Date:** Wednesday, July 13, 2022 3:49:37 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This 2014 EPA document (<https://www.epa.gov/.../documents/handbook-chapter5.pdf>) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Meg Berlin

---

Meg Berlin  
1251 Greenbush Road  
Charlotte, VT 05445

**From:** [noreply@vermont.gov](mailto:noreply@vermont.gov)  
**To:** [Sargent, Bethany](#)  
**Subject:** Comments on Rule 22P009  
**Date:** Friday, July 22, 2022 8:04:08 AM

---

EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.

Comments on Rule 22P009  
Reply To: [gzakov@vlct.org](mailto:gzakov@vlct.org)  
Memorandum

To: Vermont Department of Environmental Conservation, Watershed Management Division

From: Gwynn Zakov, Municipal Policy Advocate

Date: July 21, 2022

Re: Draft Water Quality Standards, Rule Number 22P009

Please accept these comments on the Vermont Water Quality Standards, Rule Number 22P009. VLCT is submitting them on behalf of our 247 member cities and towns.

The financial impact on affected persons and parties, including municipalities with permits requiring compliance with the standards, cannot be understated. Although the agency cannot control all of the fiscal impacts on each affected person and party, it is critical for the agency to write the rules creatively and thoughtfully to lessen that burden. The following comments are submitted with this perspective in mind.

Page 9, definition of "wetland." The definition of wetland includes "potholes," however a pothole itself is never defined. If the terms is meant to include both landform and road surface potholes, VLCT objects to including potholes in the definition. We are concerned that an area such as water filled ditches, depressions, or holes in the highway exchanges and rights-of-way would qualify as a pothole. The ensuing fiscal impact to municipal public works projects would be substantial. A definition of pothole needs to be included in the definition section of the rules, and the definition must exclude road surface and associated water-filled ditches, depressions, or holes in and around road and highways systems.

Page 11, hydrology and voluntary agreements. VLCT objects to the deletion of existing language in the rules that allows the agency to join in voluntary agreements with municipalities and others relating to artificial streamflow regulations. These agreements can help all parties to work creatively and in a cost-effective manner to address any artificial streamflow regulations, and we believe they should be preserved.

Page 11, classification of water uses, "designated uses." VLCT requests that "aesthetic conditions" be defined in new subsection (3). Such an undefined term can be interpreted very broadly and the potential unintended consequences of every subjective "aesthetic condition" when interpreting and enforcing rules will be immense. The term should be clearly defined to eliminate any subjective interpretation and thereby better clarify the scope of potential designated uses that may fall under this new subsection.

**From:** [LeClair, Jacqueline](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [Arsenault, Dan](#)  
**Subject:** Comments on Vermont Triennial Review  
**Date:** Tuesday, July 26, 2022 2:59:25 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Hi Bethany – please find EPA’s comments on the VT Triennial Review for which the public notice ended last Friday. Please let either Dan or me know if you have any question.

Thank you,  
Jackie

**1. § 29A-101 Applicability:**

Section 29A-101(b) has been replaced with the following language.

(b) The applicable Water Quality Standards shall be those in effect at the time of final administrative disposition of a permit or certification. The time of final administrative disposition shall be the date upon which the Agency places the proposed permit or decision on public notice. Concerning Water Quality Certification for a License, or the renewal of a License, issued by the Federal Energy Regulatory Commission (FERC), the applicable Water Quality Standards shall be those in effect at the time that the FERC issues public notice of an application for a License.

-  
EPA believes that the “final administrative disposition of a permit or certification” should be the date upon which a final permit or certification is issued as opposed to the date upon which the Agency places the proposed permit or decision on public notice. Further, once EPA approves water quality standards (WQS) under Section 301(c) of the Clean Water Act (CWA) the new or revised WQS would be in effect for CWA purposes. Thus, the applicable WQS should be those which are in place (and approved by EPA) at the time final permit or certification issuance. For example, when EPA issues NPDES permits in NH and MA and it knows there is a potential that a new WQS will be approved during the time period between public notice of the draft permit and issuance of the final permit, it will often include language in the draft permit noting the potential for the new WQS and commitment to implement it in the final permit should it be approved in the interim. EPA believes that it would be an infrequent occurrence where WQS would change during the public notice of a permit or certification.

**2. § 29A-104 Classification of Water Uses:**

The order of the eight designated uses at Section 29A-104(d) changed. For example, “The use of waters for enjoyment of aesthetic conditions” was previously listed as number six in the list and is now number three. Also, “The use of waters for swimming and other primary contact recreation” was previously listed number 3 in the list but is now number six. Does the order of the designated uses in the list have any significance? All designated uses should receive equal protection under Vermont’s WQS.

3. § 29A-306 Use-specific Management Objectives and Criteria by Class:

Section 29A-306(f) contains the use-specific management objectives for recreation which includes swimming and other primary contact recreation. New management objective for Class B(1) waters was created at Section 29(A)-306(f)(3). These management objectives include:

(3) Class B(1).

-

(A) Management Objectives. Where sustained direct contact with the water occurs,

waters shall be managed to achieve and maintain a level of water quality

compatible with very good quality swimming and other primary contact recreation with negligible risk of illness or injury from conditions that are a result

of human activities.

-

(B) Criteria. Escherichia coli – Not to exceed a geometric mean of 126 organisms/100ml obtained over a representative period of 60 days, and no more

than 10% of samples above 235 organisms/100 ml.

EPA notes that the public notice did not contain any waters that were being classified as B(1) for recreation. If any waters are proposed to be downgraded from Class A(1) or A(2) then a use attainability analysis pursuant to 40 C.F.R. 131.10(g) would need to be performed and submitted to EPA for final approval. Also, any waterbodies being upgraded to Class B(1) for recreation would also constitute a new or revised WQS and would need EPA approval.

Jacqueline LeClair

Chief, Water Quality and Wetlands Protection Section

**USEPA**

**5 Post Office Sq. Mailcode 06-2**

**Boston, MA 02109**

**tel: 617-918-1549**

**cell: 857-243-0811**



**From:** ANNE CARVEY  
**To:** Sargent, Bethany  
**Cc:** LaFlamme, Pete  
**Subject:** formal comment on new standards/rules for water quality in Vermont  
**Date:** Wednesday, July 13, 2022 5:59:01 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a taxpaying citizen who is concerned about our environment, I am writing with a formal comment on the Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “Mixing Zones and “Waste Management Zones” from the Water Quality Standards, due to the presence of bioaccumulative toxins such as PFAs. This 2014 EPA document (<https://www.epa.gov/handbook-Chapter 5.pdf>) urges against mixing zones when bioaccumulative toxins are involved. I urge you to heed its guidance in full.

On June 15, 2022, the EPA issued updated drinking water health advisories for PFOAs and PFOSs that replaced those that they issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur in concentrations of PFOA and PFOS that are near zero. As the attached document is from 2014, this new standard should be a wake up call that PFOAs as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

Eldon W. Carvey  
68 Brookside Drive  
Williston, Vermont 05495

**From:** [S.Christopher Jacobs](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on new Water Quality Standards/Rules  
**Date:** Thursday, July 14, 2022 7:39:29 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

As a Vermont citizen very concerned about our environment, I want to comment on proposed Vermont Water Quality Standards Rules.

I'm hoping [insisting] that you need to remove "waste management zones" and 'mixing zones". A 2014 EPA document urges against it when bio-accumulative toxins are involved. As you know on June 15, 2022, the EPA issued interim updated drinking water health advisories for PFOS and PFOA that replace those issued 2016.

As we learn more and more about PFOS and PFOA the accumulating data says that PFAS are a bio-accumulative toxin that should never be mixed into or added to our water.

Please do not allow leachate or even treated bio-leachates into anyone's drinking water....ours or Canada's

Sincerely

S Christopher Jacobs  
144 South Pitkin Rd  
Albany, Vermont

**From:** Cameron Davis  
**To:** Sargent, Bethany  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont.  
**Date:** Wednesday, July 13, 2022 3:38:28 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This 2014 EPA document (<https://www.epa.gov/.../documents/handbook-chapter5.pdf>) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

Cameron Davis  
559 Ten Stones Circle  
Charlotte, VT 05445

**From:** [Catherine Bock](#)  
**To:** [Sargent, Bethany](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Wednesday, July 13, 2022 4:07:23 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to the presence of bio-accumulative toxins, such as PFAS. This [2014 EPA document](#) urges AGAINST mixing zones when bioaccumulative toxins are involved. Please take it into consideration.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that **are near zero**. Considering that the EPA document linked above is from 2014, this new standard should be a wake up call that PFAS as a bio-accumulative toxin should **NEVER** be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

Catherine Bock  
350 VT, Extinction Rebellion VT  
175 A North Prospect St.  
Burlington, VT 05401

**From:** Kai Mikkjel Førlie  
**To:** Sargent, Bethany  
**Cc:** LaFlamme, Pete; made151353; sknightinv73  
**Subject:** Formal Comment on the New Water Quality Standards/Rules for Vermont  
**Date:** Wednesday, July 13, 2022 5:41:46 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

I hereby formally submit the following comment regarding the proposed Vermont Water Quality Standards Rule (Chapter 29A):

Please remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to prevalence in our environment of bioaccumulative toxins, such as PFAS.

As you are hopefully aware, the following EPA document:

[https://www.epa.gov/sites/default/files/2014-09/documents/handbook-chapter5.pdf?fbclid=IwAR2dySHbj6k5f\\_B8MnCCtubQ9NtngaOjb8t5SILeeJNh4ekF6y9R-zb7Ue4](https://www.epa.gov/sites/default/files/2014-09/documents/handbook-chapter5.pdf?fbclid=IwAR2dySHbj6k5f_B8MnCCtubQ9NtngaOjb8t5SILeeJNh4ekF6y9R-zb7Ue4)

...urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) which replace those it earlier issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the aforementioned document has been around a while (it was published in 2014), this new standard should be a wake up call that PFAS as a class of bioaccumulative toxins should NEVER be mixed into or added to our water.

Please do the right thing and stop allowing the mixing of bioaccumulative toxins into our water.

Sincerely,

Kai  
Burlington

[Sent from my smartphone.]

**From:** Jennifer Decker  
**To:** Sargent, Bethany; LaFlamme, Pete  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Wednesday, July 13, 2022 6:02:41 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a citizen concerned about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bio-accumulative toxins, such as PFAS. This (<https://www.epa.gov/sites/default/files/2014-09/documents/handbook-chapter5.pdf>) 2014 EPA document urges AGAINST mixing zones when bio-accumulative toxins are involved; we need you to act to support community health and safety.

On June 15, 2022, the EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those the EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the EPA document linked above is from 2014, this new standard should be a wake up call that PFAS as a bio-accumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bio-accumulative toxins in our water. I am speaking for myself and for many people who have developed severely impairing health issues living in Vermont. We are looking for answers and action.

Sincerely,

Jennifer Decker  
Hinesburg, VT  
VT PFAS/Military Poisons Coalition Member

**From:** [John McHugh](#)  
**To:** [LaFlamme, Pete](#); [Sargent, Bethany](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Monday, July 18, 2022 9:33:37 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent and Mr. LaFlamme:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This **2014 EPA document (2014 EPA document)** urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wakeup call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

--

John P. McHugh

131 Shore Road

Franklin, VT 05457

(802)272-1173

[john.p.mchugh@gmail.com](mailto:john.p.mchugh@gmail.com)

*“Land was created to provide a place for boats to visit.”*

*~Brooks Atkinson*

**From:** [Emily Lanxner](#)  
**To:** [Sargent, Bethany](#); [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Thursday, July 14, 2022 7:38:11 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bio-accumulative toxins, such as PFAS. This [2014 EPA document](#) urges AGAINST mixing zones when bio-accumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the EPA document linked above is from 2014, this new standard should be a wake up call that PFAS as a bio-accumulative toxin should **NEVER** be mixed into or added to our water.

Please do the right thing and stop mixing bio-accumulative toxins in our water.

Sincerely,

Emily Lanxner  
Mobilization for Pollinator Survival  
PO Box 289  
Hardwick Vermont 05843



**From:** Ted Montgomery  
**To:** Sargent, Bethany  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Thursday, July 14, 2022 10:20:34 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This 2014 EPA document

(<https://www.epa.gov/.../documents/handbook-chapter5.pdf>)

urges AGAINST mixing zones when bioaccumulative toxins are involved—please pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016.

The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero.

Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Keep Your Home to the Sun,

*Ted*

Ted Montgomery

GroundSwell Architects  
477 Ten Stones Circle  
Charlotte VT 05445  
802-425-7717

[ted@groundswellarchitects.com](mailto:ted@groundswellarchitects.com)  
[www.groundswellarchitects.com](http://www.groundswellarchitects.com)

**From:** [steph muzzy](#)  
**To:** [Sargent, Bethany](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Tuesday, July 19, 2022 7:32:39 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document \(2014 EPA document\)](#) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,  
Stephanie Muzzy  
168 Cumberland Rd  
Burlingtn, vt 05408

**From:** [Polly Jones](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Tuesday, July 19, 2022 12:33:42 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

This is a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those that EPA issued in 2016. Based on the 2021 Vermont Per- and Polyfluoroalkyl Substances (PFAS) Surface Water, Fish Tissue, and Wastewater Treatment Facility Effluent Monitoring Report of April 4, 2022, the "low or very low" designations can no longer be considered low. These bio-accumulative toxins are not rendered harmless through the practice of dilution.

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards. This **2014 EPA document** urges AGAINST mixing zones when bio-accumulative toxins are involved: "Bio accumulative pollutants are one example of a pollutant for which mixing zones may not be appropriate because they may cause significant human health risks such that the designated use of the waterbody as a whole may not be protected. Therefore, the EPA recommends that state and tribal mixing zone policies do not allow mixing zones for discharges of bio accumulative pollutants".

The updated EPA advisory levels consider lifetime exposure and indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that **are near zero**. Because the EPA document linked above is from 2014, this new standard should be a wake-up call that PFAS as a class of bio-accumulative toxins should **NEVER** be mixed into or added to Vermont waterbodies. For all our environmentally progressive hype, Vermont has a long way to go to catch up to it. Let's make some Water Quality Standards that we can all live with, including our children and grandchildren.

Respectfully yours,

Polly S. Jones

Manchester

**From:** [nick gray](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Wednesday, July 20, 2022 8:09:29 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document \(2014 EPA document\)](#) urges AGAINST mixing zones when bioaccumulative toxins are involved; check it out if you haven't.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that **the above linked document** is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

Nicholas Gray  
37 Hawthorne St.  
Winooski, VT 05404

**From:** [Maho Takahashi](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Thursday, July 14, 2022 2:45:25 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned resident about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to the presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document \(2014 EPA document\)](#) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

Maho Takahashi  
Burlington, VT

**From:** [Laurie Gagne](#)  
**To:** [Sargent, Bethany](#); [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards for Vermont  
**Date:** Thursday, July 14, 2022 2:57:04 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document](#) ([2014 EPA document](#)) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

Laurie Gagne  
74 Lilac Lane  
South Burlington, VT 05403

**From:** [Teresa Gerade](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Friday, July 15, 2022 9:43:03 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

I am writing to you today with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

Having reviewed the Annotated Draft of the new rules for 2022, I am shocked to see that the new rules still allow mixing zones and waste management zones. As you are well aware, there are numerous chemicals that bioaccumulate (as in the class of PFAS chemicals) in living organisms. There are also numerous chemicals that are known endocrine disruptors, and little is known about how these chemicals interact with each other. Why on earth would our own Agency of Natural Resources allow harmful pollutants that can bioaccumulate or that may cause endocrine disruption, to be discharged into our waterways at levels above the regulatory level for health and safety? Please remove "mixing zones" and "waste management zones" from the Water Quality Standards. In their 2014 Water Quality Standards Handbook, the EPA provided this strong warning:

*Additionally, states and tribes should carefully consider whether mixing zones are appropriate where a discharge contains bioaccumulative, pathogenic, persistent, carcinogenic, mutagenic, or teratogenic pollutants or where a discharge containing toxic pollutants may attract aquatic life.*

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the EPA document linked above is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should **NEVER** be mixed into or added to our water.

Please remove the "mixing zones" and the "waste management zones" from our water quality standards. Water is a precious resource, and it is not renewable.

Sincerely,  
Teresa Gerade  
89 Blake Street  
Newport, VT



**From:** PamLadds  
**To:** Sargent, Bethany; LaFlamme, Pete  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Thursday, July 14, 2022 4:48:23 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms Sargent.

I am a Newport, VT citizen and extremely concerned about our environment. Water is our scarcest resource and unless it is clean, clear and non-polluted our grandchildren will not survive! It is far too late in the game to risk any water source.

This is my formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

Phrases such as "Mixing Zones" and "waste management zones" should never be in the Water Quality Standards. Bio-accumulative toxins such as those in the pfas family, pharmaceutical products and other chemicals that interact with each other are risking catastrophe. Even the EPA, hardly the beacon of forward thinking, in **2014** said this was a risky proposition. "Dilution as a solution to pollution" is archaic and harmful thought and one that Vermont should not be encouraging. EPA 2014

The recent EPA interim (6/15/22) Drinking Water Health Advisory for PFOA, PFOS replaces the one issued in 2016. The updated advisory levels, based on new science, recognize that lifetime exposure has an impact. It is clear that negative health effects occur with concentrations of PFAS chemicals in water that are **near zero**. There is no safe exposure level. PFAS and other bioaccumulative toxins should **never** be mixed into, or added to, our water. To do so risks jeopardizing the health of current and future generations, livestock and aquatic life.

Please remove "mixing zones" and "waste management zones" from Water Quality Standards, these high risk practices have no place in regulating water standards. This points out the dangers inherent in this practice.

Please take the opportunity to do the right thing, and be

supporters of health and environmental justice.

Sincerely  
Pam Ladds  
29 Stagecoach Drive,  
Newport, VT 05855

### **Water is Life!**

You cannot begin to preserve any species of animal unless you preserve the habitat in which it dwells. Disturb or destroy that habitat and you will exterminate the species as surely as if you had shot it. So conservation means that you have to preserve forest and grassland, river and lake, even the sea itself. This is not only vital for the preservation of animal life generally, but for the future existence of man himself -- a point that seems to escape many people. -Gerald Durrell, naturalist and author (7 Jan 1925-1995)

**Pam Ladds**

**From:** [Anita Rapone](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Thursday, July 14, 2022 11:59:08 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As someone who is very concerned about the quality of our drinking water as well as the environment, I am writing to make a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to the presence of bioaccumulative toxins, such as PFAS. In its 2014 publication on water standards, the EPA warned against mixing zones when bioaccumulative toxins are involved. See:

<https://www.epa.gov/sites/default/files/2014-09/documents/handbook-chapter5.pdf>

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued earlier. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero.

Considering that the document I referenced is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should never be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,  
Anita Rapone  
83 Summit Ridge  
Burlington VT 05401

**From:** [Jenna Linn Thayer](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Friday, July 15, 2022 8:06:04 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to the presence of bioaccumulative toxins, such as PFAS. This **2014 EPA document (2014 EPA document)** urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,  
Jennifer Thayer  
12 Volz Street  
Burlington, VT 05401

Jenna Thayer (she/her)  
BIPOC, LGBTQA & Planet ally

**From:** [Hadley Priebe](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Friday, July 15, 2022 8:18:38 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to the presence of bioaccumulative toxins, such as PFAS. This **2014 EPA document (2014 EPA document)** urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

Hadley Priebe  
2046 Highgate Rd  
St Albans, VT 05478

**From:** [Karen Sturtevant](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Friday, July 15, 2022 11:48:26 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This **2014 EPA document (2014 EPA document)** urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,  
Karen Sturevant  
Williston, VT

**From:** [Nina Miller](#)  
**To:** [Sargent, Bethany](#); [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Friday, July 15, 2022 2:28:12 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document \(2014 EPA document\)](#) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,  
Nancy Miller-DeMercurio  
100 W. Canal St. #43  
Winooski Vt 05404

**From:** [Nicole Comanducci](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Friday, July 15, 2022 7:46:39 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to the presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document \(2014 EPA document\)](#) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water. Thank you for your time.

Sincerely,

Nicole Comanducci  
Cornwall, VT



**From:** [William Peery](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Sunday, July 17, 2022 9:32:38 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This **2014 EPA document (2014 EPA document)** urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely, William Peery  
2105 Notch Road  
Jericho VT 05465

**From:** [John Barrows](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Monday, July 18, 2022 10:23:51 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Send to: [bethany.sargent@vermont.gov](mailto:bethany.sargent@vermont.gov) and copy [Pete.LaFlamme@vermont.gov](mailto:Pete.LaFlamme@vermont.gov)

Subject: Formal Comment on the new Water Quality Standards/Rules for Vermont

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This **2014 EPA document (2014 EPA document)** urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Regards,

--

John Barrows  
802-363-3503

**From:** [Daniela Michaels](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Monday, July 18, 2022 11:09:12 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This **2014 EPA document** (**2014 EPA document**) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

Daniela Michaels  
1628 Button Bay Road  
Vergennes VT 05491

**From:** [Diane Dubuque](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont  
**Date:** Monday, July 18, 2022 8:03:29 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

I am very concerned about our environment and I am writing a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document \(2014 EPA document\)](#) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely, Diane

Diane E. Dubuque  
In The Ferns Stained Glass and Hand Etching  
1746 Main St. Fairfax, VT 05454  
802-370-5926  
<http://www.intheferns.webs.com>

**From:** See Lions  
**To:** Sargent, Bethany; Kamman, Neil; LaFlamme, Pete  
**Subject:** Formal Comment on the VT Water Quality Standards  
**Date:** Monday, July 18, 2022 1:05:42 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear PM Sargent, Director LaFlamme, Director Kamman and pertinent ANR folks,

As a VT resident, child of multiple generations of military service members, God-parent to seven young Vermonters, and with siblings & aging family members residing throughout the state, I am moved to send a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

While I realize the challenges for managing such a diverse watershed are myriad, I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to the presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document \(2014 EPA document\)](#) urges *against* mixing zones when bioaccumulative toxins are involved: please heed this guidance.

On June 15, 2022, the EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those the EPA issued in 2016. The updated advisory levels, which are based on more recent scientific analysis considering lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are *near zero*.

Considering that the linked document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should *never* be mixed into or added to our water.

Please ensure the health of current and future generations of Vermonters and commit to no mixing of bioaccumulative toxins into our water.

Thank you for all you do to help maintain and improve the quality of life in our state.

Wishing you all good health & a wonderful summer!

Casey Lyon  
23 Derway Dr  
Burlington, VT 05408

**From:** ralph259  
**To:** Sargent, Bethany  
**Subject:** From Ralph Corbo - Wallingford VT  
**Date:** Monday, July 18, 2022 9:26:03 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Subject: Formal Comment on the new Water Quality Standards/Rules for Vermont

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This **2014 EPA document (2014 EPA document)** urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

To view this discussion on the web visit <https://groups.google.com/d/msgid/vermont-environmental-advocacy/CAE3hedF5cDfaXiXZzSj%3D6%3D7ocSgPDHXXZ9bFpZKC6FG1s3T1kA%40mail.gmail.com>.

**From:** Henry Coe  
**To:** Sargent, Bethany  
**Subject:** Fwd: Comment on Proposed Water Quality Standards/Rules for Vermont  
**Date:** Wednesday, July 20, 2022 4:02:22 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

On Wed, Jul 20, 2022 at 3:54 PM Henry Coe <[henrycoevt@gmail.com](mailto:henrycoevt@gmail.com)> wrote:

Hello,

As a former town planning commission member, I went long ago to tour a small Vermont municipal waste water treatment facility to try to understand its functioning. I remember the operator explained that the WWTF was designed to treat organic residential sewage through a combination of aerobic and anaerobic bacterial "farming", allowing the bacteria to break down the solids, as well as physical screening, compression squeezing, and settling functions. At the end of the process, those solids which remain are separated as sludge and sludge cake. The liquid effluent becomes clear and relatively benign such that it can be spilled into the nearest surface water body. The facility does a good job with traditional household sewage. The operator went on to explain that a municipal facility is not designed to screen out, and treat for chemicals from prescription drugs, and other household cleaning chemicals. These he explained pass through the system, as do heavy metals, and "we hope" they are diluted in the river below. My visit was in the seventies, prior to the ubiquitous use of the so-called "forever chemicals" which came to light in Vermont in Bennington in from industrial contamination by PFAS of water systems in the late two thousand teens..

I was appreciative for the time the waste treatment operator spent with me but felt a disconnect upon leaving. I remembered reading Silent Spring in the sixties. Besides her point of bioaccumulation upward of poisons through the food chain of birds, Rachel Carson made the point, in the age of DDT, that DDT-related and derived newer chemical compounds, when combined with other chemical compounds resulted in new compounds whose toxic danger was greater than the sum of its parts.. Carson courageously warned against the manufacture and use of such DDT and related chemical compounds in our water and atmospheric environment. Progressive laws were enacted. Shell thicknesses of bird species then recovered, allowing hatchlings to be born and live.

The same principal is present today, sixty years later. We have only to follow to where the great majority of Vermont's solid waste is privately hauled and stored, - the Coventry landfill. In this publicly permitted, temporarily contained, private landfill facility, sited inappropriately adjacent to wetlands and within a mile of an international drinking water source for 175,000 residents, household and industrial chemical solid waste is dumped, without inspection, other than occasionally by eyeball. Who knows what new toxic chemical compounds combine and form even more toxic compounds? Open to precipitation, leachate trickles through this toxic mass and is collected and hauled, up to 60,000 gallons per day, everyday, to waste water treatment facilities, permitted by the State to accept it. While better than disposing it, end-of pipe, directly into the Black River, due to the effective action by the WWTF upon the organic sewage residual component, the practice of relying upon the WWTF to treat leachate of the myriad of toxic chemicals is a fiction. The proposed new water standards refer to " mixing zones" a certain number of feet

downstream from WWTFs. Mixing zones in rivers or streams, in the era of persistent PFAS chemicals, does not a clean river make. Such zones, based on the false assumption that dilution reduces concentrations of forever persistent chemicals, fails to understand the bioaccumulative process of contaminants in aquatic species, especially fish. This is poor scientific and public policy.

Prevention is better than cure. One kills a snake, not from cutting off its tail, but by cutting off its head. (Apologies to snakes.). Please focus your revised standards and rules on water quality, not at end-of-pipe standards, but with strong and overt emphasis to prevent ground and surface water from being polluted in the first place..

Sincerely, Henry Coe, Danville, Vermont



**From:** [Karl Novak](#)  
**To:** [Sargent, Bethany](#)  
**Subject:** Fwd: Important: PFAS Action  
**Date:** Thursday, July 14, 2022 3:52:18 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

**Subject:** Formal Comment on the new Water Quality Standards/Rules for Vermont

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to presence of bio-accumulative toxins, such as PFAS. This [2014 EPA document](#) urges AGAINST mixing zones when bio-accumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the EPA document linked above is from 2014, this new standard should be a wake up call that PFAS as a bio-accumulative toxin should **NEVER** be mixed into or added to our water.

Please do the right thing and stop mixing bio-accumulative toxins in our water.

Sincerely,

Karl and Patricia Novak  
VT PFAS/Military Poisons Coalition Member  
90 Red Truck Lane  
Hinesburg, VT 05461

**From:** [Robert Ackland](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** New Water Quality Standards/Rules for Vermont (formal comment)  
**Date:** Tuesday, July 19, 2022 10:56:37 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

I am adding my voice to others you have already received.

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document \(2014 EPA document\)](#) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,  
Robert T. Ackland, Ph.D.  
100 W. Canal St., Apt. 4  
Winooski, VT 05404

**From:** [jhendley](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Proposed new water quality standards  
**Date:** Monday, July 18, 2022 4:00:44 PM

---

EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.

Dear Ms. Sargent:

As a concerned citizen, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" in Section 29A-204 Special Zones from the Water Quality Standards, due to presence of bio-accumulative toxins, such as PFAS. The 2014 EPA document Water Quality Standards Handbook urges against mixing zones when bio-accumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the EPA document linked above is from 2014, this new standard should be a wake up call that PFAS as a bio-accumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bio-accumulative toxins in our water. Thank you!

Sincerely,

Jane Hendley  
VT PFAS/Military Poisons Coalition Member

**From:** CHRIS & SUE RACANELLI  
**To:** Sargent, Bethany  
**Cc:** LaFlamme, Pete  
**Subject:** Proposed Vermont Water Quality Standards Rule  
**Date:** Monday, July 18, 2022 12:00:37 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to the presence of bioaccumulative toxins, such as PFAS. This **2014 EPA document (2014 EPA document)** urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that **are near zero**. Considering that the attached document is from 2014, this new standard should be a wake-up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

Sue Racanelli  
270 Brazier Road  
East Montpelier, VT 05651

**From:** [mike bald](#)  
**To:** [LaFlamme, Pete](#); [Sargent, Bethany](#)  
**Subject:** Proposed VT water quality standards  
**Date:** Thursday, July 21, 2022 8:50:43 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Greetings.

Thank you for accepting my input regarding the proposed rule for water quality standards.

As with so many land managers, I have to ask about your drought awareness.

In such dry conditions, we need to modify our behaviors. The presence or absence of water alters biological processes and concentrations of toxins. We simply cannot be as careless about toxins as your agency wishes to be.

Not only are we in the fourth consecutive year (spring, summer) of unusual DRY, but on those occasions when we DO get rain, it tends to be heavy and problematic. There is no longer a set of "normal conditions" to accommodate your planned mixing zones, etc.

Your planning simply does not address current conditions, and toxins such as PFAS are not to be taken lightly.

Please evolve your agency mindset to protect water quality and public health.

Thank you,  
Michael Bald  
Royalton

**From:** [Wall-Bull Family](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [Moore, Julie](#); [Pete.LaFlamme@vermont.gov](mailto:Pete.LaFlamme@vermont.gov)  
**Subject:** Public Comment on Revised Vermont Water Quality Standards  
**Date:** Wednesday, July 20, 2022 12:07:55 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Ms. Sargent,

It is in my resolute opinion that the proposed revision below could result in a serious discrepancy that would impede the protection of our surface waters.

#### Subchapter 1. APPLICABILITY, DEFINITIONS, AND POLICIES

##### § 29A-101 Applicability

(b) The applicable Water Quality Standards shall be those in effect at the time of final administrative disposition of a permit or certification. The time of final administrative disposition shall be the date upon which the Agency places the proposed permit or decision on public notice.

In order to address this inadequacy, the current applicability standards should remain in place, those being: (b) Concerning any application, the Water Quality Standards in effect at the time of the filing shall apply.

Not all revisions are necessary or practical to the VT Water Quality Standards. Just as some of the current Water Quality Standards are necessary and practical to protect our surface waters such as: *§ 29A-101 Applicability*

*(a) Pursuant to 10 V.S.A. Chapter 47, after the use classification of any water has been established, that water shall be managed by the Secretary in order to obtain and maintain the classification for that use. The Secretary may enforce a classification and these rules against any person affected thereby who, with notice of the classification, has failed to comply.*

This Standard must be enacted now to correctly classify all the B(2) lakes that meet the A(1) criteria. By not enacting this Standard, we risk degradation of these lakes and losing the healthiest, cleanest, and most pristine surface waters in the nation.

Thank you for your time and consideration.

Respectfully,  
Holly B. Bull

**From:** [Dave and Lindy Sargent](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#); [Moore, Julie](#)  
**Subject:** Public Comment to Proposed Water Quality Standards Rule Chapter 29A  
**Date:** Friday, July 22, 2022 1:39:05 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent,

Please accept into the record my comments on the Proposed Water Quality Standards Rule Chapter 29A.

As stated in 29A-103 these Rules are written to achieve water quality according to Vermont standards and the Federal Clean Water Act, maintaining the integrity of the water and controlling discharges which will assure both the health of the public and the aquatic communities. I have questions and concerns about sections of the Antidegradation Policy (29A-105) because they contain possible loopholes which will negate the main purpose of the rules. In the former, condition 105(c)(2)(B) allows for "lower water quality is necessary to prevent substantial adverse economic or social impacts on the people of the State." Yes, regulatory standards must be achieved (C) but aren't these standards potentially going to be revised? I'm speaking about the current standards for PFAS, a very significant marker for public health and water. Since the EPA has recently (June 2022) released a new advisory that, close to zero, is far lower standard than Vermont's 20 ppt it makes me wonder if Vermont is considering the same. And which is more important, public health (including fish health) or adverse economic or social impacts to Vermonters? Clean water is clean water.

Another area of the Water Quality Standards Rule, Section 29A-204 regarding Mixing Zones, disturbs me, which I hope you will revise by disallowing Mixing Zones. Despite any needs, again, perhaps economically for the State of Vermont, or a corporation, any discharge into mixing zones represents a threat to public health. Canoeists and kayakers, fisher-people, fish and other aquatic life use the rivers where these discharges might be allowed. Efforts by lobbyists in other parts of the country have created pressure to dilute the Federal Clean Water Act. Please, protectors of Vermont's clean waters, do not create possible avenues for the State's water quality standards to be violated. We look to you to uphold the leadership of Vermont in being stewards of the environment and the people.

Thank you.

Sincerely,  
Lindy Sargent, Barton

**From:** Teresa Mills  
**To:** [Sargent, Bethany](#); [LaFlamme, Pete](#)  
**Subject:** Public comment  
**Date:** Wednesday, July 13, 2022 6:43:15 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bio-accumulative toxins, such as PFAS. This [2014 EPA document](#) urges AGAINST mixing zones when bio-accumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are **near zero**. Considering that the EPA document linked above is from 2014, this new standard should be a wake up call that PFAS as a bio-accumulative toxin should **NEVER** be mixed into or added to our water.

Please do the right thing and stop mixing bio-accumulative toxins in our water.

Sincerely,

Teresa B Mills  
Center for Health, Environment and Justice  
Falls Church, VA



**From:** [Peggy Stevens](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [Moore, Julie](#); [LaFlamme, Pete](#)  
**Subject:** Re: Public Comment on Revised Vermont Water Quality Standards  
**Date:** Tuesday, July 19, 2022 6:32:40 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

To: [bethany.sargent@vermont.gov](mailto:bethany.sargent@vermont.gov) cc: [Pete.LaFlamme@vermont.gov](mailto:Pete.LaFlamme@vermont.gov) ,  
[julie.moore@vermont.gov](mailto:julie.moore@vermont.gov)  
Re: Public Comment on Revised Vermont Water Quality Standards

Dear Ms. Sargent,

I have read the proposed revisions for Vermont's Water Quality Standards closely. While I see that some language changes have been made to make the intention of these Standards clearer, which I applaud, there are concerns raised for example, in this section:

*§ 29A-101 Applicability*

*(a) Pursuant to 10 V.S.A. Chapter 47, after the use classification of any water has been established, that water shall be managed by the Secretary in order to obtain and maintain the classification for that use. The Secretary may enforce a classification and these rules against any person affected thereby who, with notice of the classification, has failed to comply.* This language is relevant in the case of the eight lakes in the state that currently are eligible and under consideration to be reclassified as A(1) lakes. It is right and good for the Secretary to have authority over these incredibly rare and valuable water bodies. In that the Secretary has the authority to grant the A(1) classification right now, it would seem not only appropriate but morally imperative to do so immediately.

*(b) Concerning any application, the Water Quality Standards in effect at the time of the filing shall apply. These Water Quality Standards shall apply to those applications, including applications for the renewal of existing approvals, that are filed on or after the date upon which the amended standards become effective, and to all other activities that occur after that date.*

*(b) The applicable Water Quality Standards shall be those in effect at the time of final administrative disposition of a permit or certification. The time of final administrative disposition shall be the date upon which the Agency places the proposed permit or decision on public notice.* This language appears to allow a loophole even in the case of an A(1) eligible lake that is awaiting reclassification but has not yet received it. For example, as of this date, currently four of these lakes have petitioned for reclassification, had been granted a hearing and then had it postponed. This language leaves those four lakes, as well as the other four that have not yet petitioned for reclassification, potentially vulnerable to any development that may be proposed and permit applied for before the reclassification to A(1) is approved. For this reason, I propose this language be changed in order to ensure that all of our A(1) eligible water bodies are preserved and protected in perpetuity. For example, **“With the exception of all water bodies currently eligible for reclassification as A(1) water bodies, and in order to ensure their protection,”** *The applicable Water Quality Standards shall be those in effect at the time of final administrative disposition of a permit or certification. The time of final administrative disposition shall be the date upon which the Agency places the proposed permit or decision on public notice.*

Another concern relates to Definitions “(26) mixing zone”, in particular because of recently

reported guidance from the US EPA re: PFAS exposure limits. This concern relates to several sections of the revised Vermont WQS, and requires further revision in order to accommodate the new exposure limits to PFAS. Foremost is the reference to “mixing zones” and “waste management zones”. This **2014 EPA document** recommends that the term mixing zones be abolished when bio-accumulative toxins are involved.

This excerpt (p.9)

*“Additionally, states and tribes should carefully consider whether mixing zones are appropriate where a discharge contains bioaccumulative, pathogenic, persistent, carcinogenic, mutagenic, or teratogenic pollutants or where a discharge containing toxic pollutants may attract aquatic life. Bioaccumulative pollutants are one example of a pollutant for which mixing zones may not be appropriate because they may cause significant human health risks such that the designated use of the waterbody as a whole may not be protected. 5 Therefore, the EPA recommends that state and tribal mixing zone policies do not allow mixing zones for discharges of bioaccumulative pollutants. The EPA adopted this approach in 2000 when it amended its 1995 Final Water Quality Guidance for the Great Lakes System at 40 CFR Part 132 to phase out mixing zones for existing discharges of bioaccumulative pollutants within the Great Lakes Basin and ban such mixing zones for new discharges within the Basin.”*

*and this from [https://www.earthisland.org/journal/index.php/magazine/entry/the\\_solution\\_to\\_pollution\\_is\\_still\\_dilution/](https://www.earthisland.org/journal/index.php/magazine/entry/the_solution_to_pollution_is_still_dilution/) “The passage of the Clean Water Act intended to end the idea that “dilution is the solution to pollution. But pressure from the nation’s biggest polluters prompted the creation of a loophole called “mixing zones” from the nation’s biggest polluters prompted the creation of a loophole called “mixing zones”.*

These terms should be removed from the revised WQS due to the known presence of bio-accumulative PFAS compounds in Vermont’s waterbodies, including Lake Memphremagog which, among all of its uses, also is a drinking water source for well more than a hundred thousand humans as well as habitat for innumerable wildlife species.

On June 15, 2022, EPA issued interim updated drinking water health advisories for bioaccumulative PFAS compounds, including perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near and below zero. There is literally no safe exposure level for these compounds.

The class of PFAS compounds, as you know, are well researched as are the harmful effects on human health. These negative health effects are many and include hormone disruption, certain cancers, developmental and behavioral effects, diabetes, obesity, and many others. Importantly, it must also be recognized that the aggregate amounts of individual PFAS chemicals must also be considered, since individual PFAS chemicals rarely occur alone, but most often in combination with others.

For example, the recently published Vermont ANR study of PFAS in fish tissue samples in Lake Memphremagog reports individual PFAS analytes in ppb instead of ppt; does not aggregate results for total individual PFAS compounds, and in Lake Trout only includes seven of the 36 PFAS analytes, all of which provides the misleading impression that our PFAS levels in Memphremagog fish are safe for human consumption. Efforts to explain that PFAS standards for drinking water are different than for fish tissue also cloud the public’s understanding of exactly what constitutes “safe exposure”.

While Vermont had set drinking water standards at 20ppt, which exceeded the previous EPA standard of 70 ppt, the new EPA guidance- based on scientific research specific to PFAS exposure- now makes clear that there is virtually no safe exposure level to PFAS chemicals. These new standards for exposure to PFAS chemicals have been drastically downgraded due to the bio-accumulative effects of PFAS. Vermont's action level for end-of-pipe discharge is 2 ppt, which now must be revisited.

Further, the fact that:

- landfill leachate generated at the NEWSVT landfill in Coventry has been disposed of unfiltered for PFAS (and the countless other landfill toxins found in leachate) in several Vermont water bodies including Memphremagog;
- that leachate is proven to "break out" in Coventry and thus runoff from the landfill, contaminating ground water, wetlands and surface waters;
- that consideration is being given to permitting leachate and groundwater PFAS treatment facilities- for UD3 effluent and for the entire amount of leachate generated by the landfill in the millions of gallons per month, and
- that the effluent would be permitted to be discharged into the bordering wetlands, then the Black River, which flows immediately to the South Bay of Memphremagog

all have direct relationship to language in the revised Vermont WQS regarding "toxic substances" "point source" and "non-point source" discharges that must be reconsidered as plans to confront the crisis of leachate contamination of Vermont's water bodies.

It is the sole responsibility of the state to identify and manage any and all sources of pollution and to develop and oversee the technologies and management plans and practices designed to prohibit toxic contamination of Vermont's ground and surface waters.

Every effort must be taken to ensure that the protection from degradation and the preservation of Vermont's waters takes precedence over any other enterprise, for the sake of the health and safety of Vermont's environment and the public health of Vermonters, international neighbors, and the fish and wildlife species.

Sincerely,  
Peggy Stevens  
Charleston, Vermont

**From:** [Mary Ellen Tamulonis](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** Stop Mixing Bioaccumulative Toxins in Our Water  
**Date:** Friday, July 15, 2022 2:28:06 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document \(2014 EPA document\)](#) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

Mary Ellen Tamulonis  
226 Cobbleview Dr.  
Colchester, VT 05447

**From:** [Sally Millichamp](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [Pete.Flamme@vermont.gov](mailto:Pete.Flamme@vermont.gov)  
**Subject:** Toxins in our water  
**Date:** Monday, July 18, 2022 11:53:20 AM

---

EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.

Dear Ms Sargent,  
Please do the right thing, and stop mixing bioaccumulative toxins in our water.

Sincerely,  
Sally Millichamp

Sent from my iPhone

**From:** [andrea marion](#)  
**To:** [Sargent, Bethany](#)  
**Subject:** Vermont Water quality standards rule  
**Date:** Thursday, July 14, 2022 1:12:50 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This **2014 EPA document (2014 EPA document)** urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

andrea oconnor  
28 germain st  
burlington vt 05401

“Nevertheless, she persisted.”

..it’s really about every woman who really had to use her tenacity and courage to accomplish whatever she set out to accomplish. It’s universal,” said Molly Murphy MacGregor, executive director and co-founder of the National Women’s History Project.

[www.andreamarion.com](http://www.andreamarion.com)  
802-233-1161

**From:** [Liz Furkay](#)  
**To:** [Sargent, Bethany](#)  
**Subject:** Vermont Water Quality Standards  
**Date:** Thursday, July 14, 2022 11:02:15 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bio-accumulative toxins, such as PFAS. This **2014 EPA document** urges AGAINST mixing zones when bio-accumulative toxins are involved; please pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the EPA document linked above is from 2014, this new standard should be a wake up call that PFAS as a bio-accumulative toxin should **NEVER** be mixed into or added to our water.

Please do the right thing and stop mixing bio-accumulativetoxins in our water.

Sincerely,

Elisabeth Furkay  
VT PFAS/Military Poisons Coalition Member

[Sent from Yahoo Mail for iPhone](#)

**From:** [Betsy Nolan](#)  
**To:** [Sargent, Bethany](#)  
**Subject:** Vermont Water Quality Standards  
**Date:** Thursday, July 14, 2022 4:23:38 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a citizen concerned about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document\(2014 EPA document\)](#) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,

Betsy Nolan  
9 Anita Ct  
Winooski, VT 05404



**From:** [Lizzy Sheehan](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [LaFlamme, Pete](#)  
**Subject:** VT water quality standards  
**Date:** Thursday, July 14, 2022 11:40:11 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This **2014 EPA document (2014 EPA document)** urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Lizzy Sheehan  
37 Bright Street #105  
Burlington Vermont

--

**Shifts Happen**

**Elizabeth A Sheehan (AKA Liz/zy)**

**From:** Carolyn Smiles  
**To:** Sargent, Bethany  
**Subject:** Water Quality and PFAS  
**Date:** Saturday, July 16, 2022 7:25:58 AM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Bethany Sargent:

As a concerned citizen regarding our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to the presence of bioaccumulative toxins, such as PFAS. This **2014 EPA document (2014 EPA document)** urges AGAINST mixing zones when bioaccumulative toxins are involved. Please note this and make this removal. I kindly ask you to email me back once this removal has happened. Thanks.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please act to stop mixing bioaccumulative toxins in our water. ,  
We need to rid Vermont waters of PFAS.  
Thank you very much.

Sincerely,  
Carolyn Smiles  
Essex Junction, VT

**From:** [Charles Thorpe](#)  
**To:** [Sargent, Bethany](#)  
**Cc:** [PeteLaFlamme@vermont.com](mailto:PeteLaFlamme@vermont.com)  
**Subject:** Water quality standards rule  
**Date:** Thursday, July 21, 2022 1:29:53 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove “mixing zones” and “waste management zones” from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document \(2014 EPA document\)](#) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero. Considering that the attached document is from 2014, this new standard should be a wake up call that PFAS as a bioaccumulative toxin should NEVER be mixed into or added to our water.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,  
Charles Thorpe  
PS

I drink tap water, so this is important to me.  
151 Hyde St  
Burlington VT

**From:** [Kate Brewer](#)  
**To:** [Sargent, Bethany](#); [LaFlamme, Pete](#)  
**Subject:** Water Quality Standards  
**Date:** Monday, July 18, 2022 12:39:40 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned citizen about our environment, I am writing with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards, due to presence of bioaccumulative toxins, such as PFAS. This [2014 EPA document \(2014 EPA document\)](#) urges AGAINST mixing zones when bioaccumulative toxins are involved; you need to pay attention to it.

On June 15, 2022, EPA issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero.

Please do the right thing and stop mixing bioaccumulative toxins in our water.

Sincerely,  
Katherine Brewer

590 Arnold Bay Road  
Vergennes, VT 05491

**From:** [Carole O'Connell](#)  
**To:** [Sargent, Bethany](#)  
**Subject:** Water Quality Standards  
**Date:** Tuesday, July 19, 2022 12:47:49 PM

---

**EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.**

Dear Ms. Sargent:

As a concerned Vermonter, I am providing you with a formal comment on the proposed Vermont Water Quality Standards Rule (Chapter 29A).

I urge you to remove "mixing zones" and "waste management zones" from the Water Quality Standards. Bio-accumulative toxins, such as PFAS which persist in the environment, will continue to accumulate when dilution is used as a method of reducing water pollution.

On June 15, 2022, the EPA issued updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those the EPA issued in 2016. The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that negative health effects could occur with concentrations of PFOA or PFOS in water that are near zero.

Dilution will do little to prevent the negative effects that water pollution causes in the environment. It is not a solution to this problem, which must be addressed at the source.

Sincerely yours,

Carole O'Connell  
Member, Newport Planning Commission  
Newport, Vermont

## 2022 Proposed Vermont Water Quality Standards Rule (Chapter 29A) – Response to Public Comments

The Vermont Department of Environmental Conservation (VTDEC) presented the proposed Vermont Water Quality Standards Rule (Chapter 29A) to the Interagency Committee on Administrative Rules (ICAR), the first step in the rulemaking process, in May. The rule was subsequently filed with and noticed by the Secretary of State on May 25, 2022. Public comments on the proposed rule were accepted through July 22, 2022. All comments submitted in their original form, the proposed Water Quality Standards Rule, and updates on the rulemaking process are posted on the [Vermont Water Quality Standards webpage](#). Comments requesting specific changes to the proposed Vermont Water Quality Standards Rule are included below. These comments are excerpted and summarized and organized by the relevant subsection of the Vermont Water Quality Standards Rule, with VTDEC responses following. Similar comments are grouped together with a single response.

### General Comments

#### Comments Requesting Additional Changes:

1. The Notice of Proposed Rulemaking does not sufficiently evaluate the economic impacts of the proposed rule changes.

*VTDEC Response:* Federal and state government agencies, private enterprises, businesses, and individual citizens whose operations, development, or land-use activities require a permit or certification to ensure compliance with the WQS may be affected by the adoption of this rule.

Updates clarifying the application of the standards to wetlands and articulating the requirements associated with Section 401 Water Quality Certifications, pursuant to Act 32, are expected to have negligible economic impact because they simply clarify existing policy with regard to wetlands and 401 Certification applications, consistent with federal requirements. Information regarding project alternatives is currently provided by most applicants for federal permits; the burden from this change will fall on Agency staff reviewing 401 applications to evaluate the sufficiency of the alternatives analysis and provide an assessment of that analysis in each Certification issued.

Modifying the applicability language in Section 29A-101 is expected to have a negligible impact on regulated entities. Applicants for discharge permits issued pursuant to the State's delegated authority under the Clean Water Act will be required to apply the WQS in effect at the time of permitting decision rather than complete application. In the limited circumstance where the WQS are revised between the time of permit application and permit issuance, an applicant may be required to update their application to address any new applicable standard.

Updates to the hydrology policy and hydrology criteria will have negligible economic impacts on regulated entities. The requirement that applicants conduct site-specific flow studies to determine support of aquatic habitat in Class B(1) waters will likely have an impact on permit applicants required to conduct such studies if applicants had not otherwise intended to conduct site-specific studies. Updates to the methodology for evaluating aquatic habitat will have negligible economic impact, since the revised methodologies are implicit in the current language broadly requiring habitat assessments.

The reclassification of three streams in the Lower Otter Creek Watershed will not have a direct economic impact on landowners within the watersheds of those streams.

Updates to Appendix C toxic chemical criteria consistent with EPA criteria are required by federal regulation. The impacts of these criteria updates will be limited to the small number of wastewater treatment facilities and industrial dischargers that discharge one or more of these specific chemicals and that may need to implement additional measures under their next discharge permit to meet the revised standards.

2. In light of EPA's new Drinking Water Health advisories for PFAS, we request the public comment period and process be extended to enable the public to review ANR's updated Water Quality Standards.

*VTDEC Response:* EPA's advisories for drinking water, including the one issued in June 2022, are interim advisories until a new National Primary Drinking Water Regulation is established. EPA has not yet established National Recommended Water Quality criteria for Aquatic Life and Human Health (i.e., § 304(a) criteria) for PFAS, which serve as the basis for state water quality toxics criteria. EPA was accepting public comments on draft aquatic life criteria for PFOA and PFOS through July 2022. Once finalized, Vermont will adopt these recommended criteria into water quality standards. The draft aquatic life criteria are significantly higher than the interim drinking water health advisory EPA issued in June and the observed PFAS concentrations in Vermont surface waters.

## **Subchapter 1. APPLICABILITY, DEFINITIONS, AND POLICIES**

### **§ 29A-101 Applicability**

#### **Comments on Proposed Changes:**

3. The current applicability standards should remain in place, those being: "(b) Concerning any application, the Water Quality Standards in effect at the time of the filing shall apply."

*VTDEC Response:* As a delegated authority, the VTDEC is required to issue discharge permits that meet the minimum requirements of the Clean Water Act and associated regulations, and that are consistent with National Pollutant Discharge Elimination System (NPDES) permits issued by EPA. Any permit issued pursuant to this authority must include conditions "to provide for and ensure compliance with all applicable requirements of CWA and regulations." 40 C.F.R. § 122.43(a). Federal regulations require that for a state-issued permit, "...an applicable requirement is a State statutory or regulatory requirement which takes effect prior to final administrative disposition of a permit." 40 C.F.R. § 122.43(b)(1). The proposed applicability language is necessary to comply with the requirements of the Clean Water Act.

4. EPA believes that the "final administrative disposition of a permit or certification" should be the date upon which a final permit or certification is issued as opposed to the date upon which the Agency places the proposed permit or decision on public notice. Further, once EPA approves water quality standards (WQS) under Section 301(c) of the Clean Water Act (CWA) the new or revised WQS would be in effect for CWA purposes. Thus, the applicable WQS should be those which are in place (and approved by EPA) at the time final permit or certification issuance.

*VTDEC Response:* The VTDEC proposes the following revisions: The applicable Water Quality Standards shall be those in effect at the time of ~~final administrative disposition of a final permit or certification issuance.~~ The time of final administrative disposition shall be the date upon which the Agency places the proposed permit or decision on public notice. Concerning Water Quality Certification for a License, or the renewal of a License, issued by the Federal Energy Regulatory Commission (FERC), the applicable Water Quality Standards shall be those in effect at the time that the FERC issues notice of application ready for environmental analysis for a License.

#### **Comments Requesting Additional Changes:**

5. I propose the applicability language be changed in order to ensure that all of our A(1) eligible water bodies are preserved and protected in perpetuity. For example, “With the exception of all water bodies currently eligible for reclassification as A(1) water bodies, and in order to ensure their protection.”

*VTDEC Response:* To convey the level of protection inherent in reclassification, the VTDEC believes it is necessary to follow the reclassification procedure, which requires interdepartmental coordination, technical review of water quality data relative to the proposed classification, and public outreach, including landowners in the affected watershed, prior to initiating rulemaking. Further, as shown in § 29A-104(b), “Existing classifications of water uses shall be maintained unless reclassified in a manner consistent with the Act and in compliance with all applicable federal requirements, including 40 C.F.R. § 131.10(g).”

#### **§ 29A-102 Definitions**

##### **Comments on Proposed Changes:**

6. Including "portion of the riparian corridor that support woody debris recruitment and temperature refuge" into the definition of Physical Habitat Structure and Stream Processes suggests the rules will govern these “portions” of the riparian corridors, yet there is no basis for that or any suggested rulemaking to do so. So why include portions of riparian corridor in the definition? Physical habitat is referenced throughout the rule in terms of management objectives and criteria for determining Water Quality Classification. While I cannot find any sort of direct regulatory requirements applied to the riparian area under the rules, it suggests expansion of criteria to out of stream characteristics. It not only conflicts but confuses/complicates the application of other definitions such as Flow Characteristics (16), which refers to physical habitat structure –where in this instance, clearly is limited to in-stream flow characteristics not riparian. Adding this to the definition of Physical Habitat Structure clearly expands the present spatial scope far outside of in-stream areas, streambanks, woody debris above the stream bed as live or dead vegetation within a riparian area that could add to instream debris or provide temperature moderating capability could encompass vegetation as far as 150 feet from the actual stream. Adding this phrase to these definitions is unnecessary, is already included within the riparian policy, creates confusion and inherently conflicts with the in-stream or jurisdictional wetlands scope of the Clean Water Act or 401 authority.

*VTDEC Response:* This additional language is intended to clarify the extent of the riparian area. The riparian area will be considered to the extent it supports woody debris recruitment and temperature refuge, which directly influences both instream habitat and stream processes, and therefore affects the ability of the water to meet the aquatic biota and aquatic habitat designated uses.



### **Comments Requesting Additional Changes:**

7. The definition of wetland includes “potholes,” however a pothole itself is never defined. If the terms is meant to include both landform and road surface potholes, VLCT objects to including potholes in the definition. We are concerned that an area such as water filled ditches, depressions, or holes in the highway exchanges and rights-of-way would qualify as a pothole. The ensuing fiscal impact to municipal public works projects would be substantial. A definition of pothole needs to be included in the definition section of the rules, and the definition must exclude road surface and associated water-filled ditches, depressions, or holes in and around road and highways systems.

*VTDEC Response:* The definition of wetlands included in the rule is the statutory definition found at 10 V.S.A. § 902. The VTDEC disagrees that water filled ditches, depressions, or holes in the highway exchanges and rights-of-way could be construed as jurisdictional wetlands. The Wetland Rules describe the characteristics necessary to be a jurisdictional wetland.

8. The concept of “assimilative capacity” should not be applied to bioaccumulative toxins.

*VTDEC Response:* The VTDEC does not apply the concept of assimilative capacity in consideration of bioaccumulative toxins.

9. “Mixing zones” and “waste management zones” should be eliminated from the Vermont Water Quality Standards.

*VTDEC Response:* Mixing zones are provided for in both the federal Clean Water Act and state statute and are limited to 200 feet from the point of discharge. Waste management zones indicate reaches where the public may be at a slightly elevated risk of exposure to pathogens when swimming because of a direct discharge upstream. However, Water Quality Standards must still be met, and all designated uses maintained in waste management zones.

10. While we acknowledge that the definition of “Wetland” under the Draft Rule corresponds with other Vermont regulations and statutes, we object to the exclusion of wetlands in agricultural lands used to “grow food or crops in connection with farming activities.”

*VTDEC Response:* The Wetlands definition is consistent with the definition in statute, and a rule cannot supersede or overcome the definition in statute.

### **§ 29A-103 General Policies**

#### **Comments on Proposed Changes:**

11. VLCT objects to the deletion of existing language in the rules that allows the agency to join in voluntary agreements with municipalities and others relating to artificial streamflow regulations. These agreements can help all parties to work creatively and in a cost-effective manner to address any artificial streamflow regulations, and we believe they should be preserved.

12. By deleting the phrase, “to the extent practicable”, it suggests that there is always a means of determining conditions which preserve the natural flow regime of waters. GRH acknowledges that is the goal but as a policy, it must recognize that cannot always be achieved and therefore we strongly recommend the phrase remain in the policy statement. Sometimes it is simply not possible to restore to natural flow regime; perhaps close but not absolute and therefore the phrase “to the extent practicable” is necessary. Including it reflects reality and does not create any sort of loop-hole. As stated, it acknowledges the need for flexibility when addressing complex streamflow systems that, in some cases, stray from a pure natural flow regime but benefit designated uses and maintain or expand biological integrity.
13. For the same reason, GRH believes it is important to recognize there are circumstances when artificial streamflow regulation is a necessary reality that cannot be totally eliminated. The continued use of the word “cooperating” in the same sentence recognizes the need for a degree of case specific flexibility. Policy is not the same as a goal and it has to be grounded and reflect the landscape it applies to.

*VTDEC Response (to comments 11-13):* The proposed strikethrough of “in achieving voluntary agreements relating to artificial streamflow regulation” will not change the scope of the state’s authority under §1003 or in implementing the Hydrology Policy. The Hydrology Policy is implemented through compliance with the Hydrology Criteria. The Hydrology Criteria recognize that there can be a change in the natural flow regime, but only to the extent it fully supports uses and complies with all applicable water quality criteria. Removal of the phrase “to the extent practicable” from the Hydrology Policy statement is intended to convey that the Standards provide a means for determining conditions which preserve the natural flow regime.

#### **Comments Requesting Additional Changes:**

14. Under § 29A-103(e) of the Draft Rule, the language as written indicates that the Secretary “shall” initiate rulemaking for recommendations made in the Tactical Basin Plans. However, to our knowledge, this policy has not been historically followed. This is particularly troublesome in regard to recommendations for the reclassification of State waters from B(2) to B(1) for fishing and/or for aquatic biota, and to A(2) and A(1) waters. The failure to initiate rulemaking leaves those waters without needed protections to maintain their chosen water quality classifications. The following language is proposed:
  - (5) Upon adoption of a tactical basin plan, the Secretary shall promptly initiate rulemaking ~~and shall give due consideration to~~ on the recommendations contained in the tactical basin plan.

*VTDEC Response:* Tactical basin plans are meant primarily as planning documents. The level of scrutiny and community involvement specific to recommending reclassification of surface waters in a tactical basin plan is not as thorough as that afforded to pre-rulemaking review and public participation which occurs during a watershed-specific reclassification process.

15. In an effort to assist with climate resilience preparations in the State, we suggest adding a new subsection (6) to § 29A-103(e):
  - (6) So that tactical basin plans help to advance Vermont’s goals for natural disaster-preparedness, climate resilience, and habitat management, the Secretary shall make recommendations pursuant to the State Hazard Mitigation Plan and Vermont Conservation Design, and, shall coordinate with the following: the Director of Vermont Emergency Management; the Commissioner of the Fish and Wildlife Department; and the Commissioner of the Department of Forests, Parks, and Recreation.

*VTDEC Response:* The suggested language is beyond the scope of tactical basin planning authority in 10 V.S.A. § 1253.

## § 29A-104 Classification of Water Uses

### Comments on Proposed Changes:

16. GRH would like to understand the purpose and meaning behind specifying [adding], “*the designated uses of the water, and*”. The factors which are already listed under § 29A-105(b)(1-5) appear to represent designated uses. If so, why the need to also add “*the designated uses of the water, and*” as if they were distinct and different.

*VTDEC Response:* The addition of “all designated uses” clarifies that the designated uses, regardless of whether they are being attained, must be considered in determining the existing uses to be protected and maintained.

17. GRH considers a water withdrawal or hydro project that exists or previously existed on or after November 28, 1975 to meet the criteria as an Existing Use and therefore the title of (b) Protection and Determination of Existing Uses is misleading. Rather this sub-section is about determining the level or degree of protection existing uses are warranted, not determining whether they exist or not. Existence is defined by the definition and this sub-section states “*those existing uses shall be maintained and protected regardless of the water’s classification*”. The changes made in subsection (b) suggest they might not be protected and therefore is counter to the first sentence.

*VTDEC Response:* The title of § 29A-104(b) accurately characterizes the Agency’s authority and responsibility to determine existing uses on a waterbody-specific basis. The proposed changes to subsection (b) do not undermine the Agency’s obligation to protect existing uses, they simply clarify the considerations relevant to the determination of an existing use. Pursuant to the Clean Water Act, the Agency is required to maintain the water quality necessary to support designated uses. Vermont has not adopted water withdrawals or hydroelectric power production as designated uses of the state’s waters (see Response to Comment 20).

18. The order of the eight designated uses at Section 29A-104(d) changed. For example, “The use of waters for enjoyment of aesthetic conditions” was previously listed as number six in the list and is now number three. Also, “The use of waters for swimming and other primary contact recreation” was previously listed number 3 in the list but is now number six. Does the order of the designated uses in the list have any significance? All designated uses should receive equal protection under Vermont’s WQS.

*VTDEC Response:* The order of designated uses was changed to align with order in § 29A-306 Use-specific Management Objectives and Criteria by Class. The overall order of designated uses is not intended to reflect any specific prioritization or hierarchy.

### Comments Request Additional Changes:

19. VLCT requests that “aesthetic conditions” be defined in new subsection (3). Such an undefined term can be interpreted very broadly and the potential unintended consequences of every subjective “aesthetic condition” when interpreting and enforcing rules will be immense. The term should be clearly defined to eliminate any subjective interpretation and thereby better clarify the scope of potential designated uses that may fall under this new subsection.

*VTDEC Response:* Numeric criteria for aesthetic use for lakes have been developed and incorporated into the Vermont Water Quality Standards and are currently in development for streams.

20. Existing hydropower should be added as a Designated Use.

*VTDEC Response:* The objective of the Clean Water Act is to protect and maintain the physical, chemical, and biological condition of Waters of the US, and the uses supported by high quality waters. Pursuant to this policy objective, states are required to adopt standards to protect the public health or welfare, enhance the quality of water, and serve the purposes of the Clean Water Act. VTDEC believes that adopting a designated use that could degrade water quality, such as hydroelectricity production, does not align with the objective of the Clean Water Act or the State of Vermont's Water Quality Policy articulated in 10 V.S.A. § 1250. Furthermore, adopting hydroelectric production as a designated use would not relieve the VTDEC of the obligation to impose water quality criteria stringent enough to protect other designated uses such as aquatic biota and wildlife. Through our Section 401 Water Quality Certification of FERC licenses, we ensure that hydroelectric facilities are operated in a manner that does not violate the Vermont Water Quality Standards.

21. We urge the Department to remove the following under § 29A-104(d)(8): “[t]he use of water for irrigation of crops and other agricultural uses.” Akin to the generation of electric power, the growing of agricultural crops and the vague catch-all “other agricultural uses,” are commercial ventures. Like hydropower, irrigation does not necessarily rely on high quality water as other uses, such as aquatic biota and habitat, require it. Further, also resembling hydropower, agricultural uses can result in the degradation of water quality, in this case through the discharge of nutrient pollution. Accordingly, irrigation for agriculture should not be afforded the same level of protection as aquatic biota or other uses and § 29A-104(d)(8) should be removed from the list of designated uses.

*VTDEC Response:* Per EPA policy, all designated uses must receive equal protection under the Vermont Water Quality Standards. Vermont could seek to remove a designated use through a use attainability analysis on a waterbody-by-waterbody basis, if it is shown that use has not and cannot be attained and is subject to EPA approval.

22. GRH encourages the Department to clarify the distinction between existing uses and designated uses.

*VTDEC Response:* “Existing use” means a use which has actually occurred on or after November 28, 1975, in or on waters, whether or not the use is included in the standard for classification of the waters, and whether or not the use is presently occurring. “Designated use” means any value or use, whether presently occurring or not, for which a water has been designated as Class A(1), A(2), B(1), or B(2). Under the Clean Water Act, states are required to specify designated uses that they consider appropriate water uses to be achieved and protected. Designated uses are listed in § 29A-104(d). Existing uses are a confirmation of the set of designated uses in the Vermont Water Quality Standards regardless of the classification of the water.

23. GRH suggests the language be modified to read, “*In determining the extent to which existing uses will to be protected and maintained under this section and all other sections of these rules, the Secretary shall consider the designated uses of the water, and at least the following factors: ...*” o GRH further recommends the last item proposed for **addition**, “*When existing uses are incompatible, or conflict with designated uses, conditions shall be imposed to attain the water quality necessary to support the highest and best use.*” be modified to read, “*When existing uses appear are incompatible, or appear to conflict with designated uses, conditions shall be imposed to attain the water quality necessary to support designated use without eliminating the existing use which must also be maintained and protected of the highest and best use.*” This will maintain consistency with the first sentence in sub-section (b), eliminate the confusion and undefined term highest and best use, and provide for a realistic yet flexible approach needed in conflicting situations.

*VTDEC Response:* The phrase “highest and best use” is not included in the proposed rule. Existing uses are a confirmation of the set of designated uses in the Vermont Water Quality Standards regardless of the classification of the water.

## § 29A-105 Antidegradation Policy

### Comments Requesting Additional Changes:

24. We recommend the Department clarify the Antidegradation Policy to ensure that no activity may degrade water quality, or aquatic habitat, without complying with Antidegradation Policy—including actions to protect existing uses.

*VTDEC Response:* The Antidegradation Policy only applies to projects seeking authorization under permits that must comply with the Vermont Water Quality Standards. In the Antidegradation Policy, Tier 1, Protection of Existing Uses, ensures that existing uses of waters, and the level of water quality necessary to protect those existing uses, shall be maintained and protected.

25. Is not the purpose of an anti-degradation policy to maintain water quality now and for the future? Why doesn't this policy agree with § 29A – 206, regarding permits under the Clean Water Act?

*VTDEC Response:* The antidegradation policy allows for a limited reduction in the existing higher quality of such waters only when it is shown that:

- (A) through the applicable permitting or approval process, the Secretary has provided public notice of the draft decision and an opportunity for public comment on the decision;
- (B) after an analysis of alternatives, allowing lower water quality is necessary to prevent substantial adverse economic or social impacts on the people of the State; and
- (C) there shall be achieved the highest statutory and regulatory requirements for all new or existing point sources, and all cost effective and reasonable best management practices for nonpoint source control, consistent with state law.

26. I have questions and concerns about sections of the Antidegradation Policy (29A-105) because they contain possible loopholes which will negate the main purpose of the rules. In the former, condition 105(c)(2)(B) allows for “lower water quality is necessary to prevent substantial adverse economic or social impacts on the people of the State.” Yes, regulatory standards must be achieved (C) but aren't these standards potentially going to be revised?

*VTDEC Response:* States are required under the federal Clean Wate Act to review and as appropriate, adopt new or revised water quality standards at least every three years. Regulations may change as a result of changes to federal or state statute or rules.

## § 29A-106 Discharge Policy

### Comments Requesting Additional Changes:

27. What rules require consideration of cumulative effects of multiple discharges in surface waters? How do these regulations enable us to ascertain the accumulation of toxins in waters in order to prevent degradation of waters?

*VTDEC Response:* The Interim Antidegradation Implementation Procedure requires the consideration of cumulative impacts in authorizing new or increased discharges.

## Subchapter 2. APPLICATION OF STANDARDS

### § 29A-204 Special Zones

### Comments Requesting Additional Changes:

28. Remove “mixing zones” from the Water Quality Standards.

*VTDEC Response:* Mixing zones are provided for in both the federal Clean Water Act and state statute and are limited to 200 feet from the point of discharge.

29. Don't use mixing zones for bioaccumulative toxins.  
30. DEC must carefully re-examine and curtail the practice of using mixing zones as they can no longer be universally applied in our wastewater system where PFAS are present.

*VTDEC Response (to comments 29 and 30):* The VTDEC does not use mixing zones to meet Water Quality Standards for bioaccumulative toxins. In accordance with current practice, the VTDEC proposes to add the following language to the definition of mixing zones: “A mixing zone shall not be used to meet water quality criteria for bioaccumulative toxins.”

31. Remove “waste management zones” from the Water Quality Standards.

*VTDEC Response:* Waste management zones indicate reaches where the public may be at a slightly elevated risk of exposure to pathogens when swimming because of a direct discharge upstream. However, Water Quality Standards must still be met, and all designated uses maintained in waste management zones.

32. Have “waste management zones” been approved by EPA?

*VTDEC Response:* EPA has approved Vermont's use of waste management zones.

## § 29A-206 Water Quality Certifications Issued Pursuant to § 401 of the Clean Water Act

### Comments on Proposed Changes:

33. Regarding the language: “*Any certification issued by the State shall establish conditions necessary to ensure that the federally licensed or permitted activity will comply with these rules, as well as with any other appropriate requirement of state law, including:*”, is this addition suggesting the provisions or permits necessary to comply with these state laws will be issued under a single WQC?

*VTDEC Response:* All applicable state permits must also be acquired regardless of whether a project requires a Section 401 Water Quality Certification.

### Comments Requesting Additional Changes:

34. Given the fact that some of these laws might not apply, it would make sense to also add the following identified text to the proposed addition, “*Any certification issued by the State shall establish conditions necessary to ensure that the federally licensed or permitted activity will comply with these rules, as well as with any other appropriate requirement of state law, as applicable, including:*”. The WQC application should be revised so that the applicant can identify those laws and regulations that would apply, as well as those that do not.

*VTDEC Response:* “as applicable,” is not necessary with the current proposed language “appropriate requirement.” It is assumed that inapplicable regulations will not be applied to a project. The application requires the applicant to list the applicable required state and federal authorizations. Listing authorizations that do not apply is neither practical nor of value.

## Subchapter 3. WATER QUALITY CRITERIA

### § 29A-303 General Criteria Applicable to all Waters

#### Comments Requesting Additional Changes:

35. How can this standard, “a maximum individual lifetime risk of no adverse effect to human health” be enforced or translated to the amount of toxins encountered in the water? Why not change the measurement of toxins in water to Maximum Contaminant Level (MCL) in parts per billion?

*VTDEC Response:* Appendix C. of the Vermont Water Quality Standards provides Water Quality Criteria, where appropriate, as a Maximum Allowable Concentration (i.e., acute criteria) and Average Allowable Concentration (i.e., chronic criteria) for the protection of aquatic biota. Human health criteria are provided in micrograms per liter (or parts per billion) unless indicated otherwise.

### § 29A-304 Hydrology Criteria

#### Comments Requesting Additional Changes:

36. In § 29A-304 Hydrology Criteria (c)(2) the existing sentence, “*The Secretary need not consider any flow study unless the study plans have obtained the Secretary’s approval*” is equally problematic from a timing and process standpoint and could result in a denial long after study scope, plans and execution have taken place.

*VTDEC Response:* It is in the applicant's best interest to obtain the Secretary's approval (i.e., through consultation and approval of VTDEC staff) of any study plans prior to conducting the study; otherwise, the applicant could be required to conduct a new study if the application is insufficient. Agency staff provide extensive consultation with project applicants to ensure that necessary information is provided.

## **§ 29A-305 Numeric Biological Indices and Aquatic Habitat Assessments**

### **Comments on Proposed Changes:**

37. Adding language that requires an Applicant to obtain Secretary approval of a study in this Section is problematic. We strongly recommend not adding the sentence, "*Applicants shall obtain the Secretary's approval of study plans prior to conducting an evaluation*" as the studies would have already been performed according to a study scope developed in consultation with Department staff.

*VTDEC Response:* It is in the applicant's best interest to obtain the Secretary's approval (i.e., through consultation and approval of VTDEC staff) of any study plans prior to conducting the study; otherwise, the applicant could be required to conduct a new study if the application is insufficient.

## **§ 29A-306 Use-specific Management Objectives and Criteria by Class**

### **Comments on Proposed Changes:**

38. Regarding the addition of new management objective for Class B(1) waters was created at Section 29(A)-306(f)(3), EPA notes that the public notice did not contain any waters that were being classified as B(1) for recreation. If any waters are proposed to be downgraded from Class A(1) or A(2) then a use attainability analysis pursuant to 40 C.F.R. 131.10(g) would need to be performed and submitted to EPA for final approval. Also, any waterbodies being upgraded to Class B(1) for recreation would also constitute a new or revised WQS and would need EPA approval.

*VTDEC Response:* The addition of a new management objective and criteria for Class B(1) waters under Section 29(A)-306(f) corrects an inadvertent omission in 2017 Vermont Water Quality Standards.



## Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

### Comments on Proposed Changes:

39. In implementing a water quality standard for aluminum, would the State of Vermont have the latitude to use dissolved aluminum concentration as the basis for comparison with derived acute and chronic criteria values? As I understand it, the convention is to use total aluminum (TAI) concentration data in these comparisons, and hence in determinations related to impairment status. The TAI method used by Vermont DEC (EPA SW-846, Rev. 1 (1992) and Rev.0 (1994)), which entails digestion of unfiltered water samples, will quantitate aluminum bound in sediment that is unlikely to become bioavailable under environmental conditions. In my view, using TAI concentrations to evaluate potential aluminum toxicity in streams may not be appropriate because a preponderance of measured aluminum may be in particulate forms that are unavailable for uptake by stream biota. Since aluminum is one of the primary elements in clay minerals in Vermont's soils, I expect that fine sediment transported by Vermont streams will typically contain high concentrations of aluminum. Does DEC have an opinion regarding the potential for inorganic aluminum bound in sediment to become available (and therefore potentially toxic) to stream biota? Are there any biological data demonstrating toxicological effects of aluminum in Vermont streams?

*VTDEC Response:* EPA Methods 200.7 and 200.8 for total recoverable aluminum are the only currently approved methods for measuring aluminum in natural waters for NPDES permits. VTDEC will revise its aluminum implementation procedure to clarify this. Using dissolved aluminum to develop criteria would underestimate toxicity. Additional information about bioavailability of aluminum and quantification methods is provided in the EPA Draft Technical Support Document for Implementing the 2018 Recommended Aquatic Life Criteria for Aluminum. If site-specific data are available for input parameters, site-specific criteria could be calculated, which may be more or less stringent than the criteria calculated when using the default input parameters. Vermont does not have data that demonstrates any toxicological effect of aluminum on aquatic biota.

### Comments Requesting Additional Changes:

40. Appendix C must include standards for per- and polyfluoroalkyl substances (PFAS) now regulated by Vermont Statute; diquat and diuron on EPA's list of hazardous substances; atrazine, glyphosate, diquat, diuron, metolachlor, and neonicotinoid insecticides, several of which are endocrine disruptors.
41. We urge the Agency to adopt surface water standards and water quality criteria for PFAS chemicals where adequate data and scientifically defensible methods from other comparable states exist.

*VTDEC Response (to comments 40 and 41):* EPA has not yet established National Recommended Water Quality criteria for Aquatic Life and Human Health (i.e., § 304(a) criteria) for PFAS, which serve as the basis for state water quality toxics criteria. EPA was accepting public comments on draft aquatic life criteria for PFOA and PFOS through July 2022. Once finalized, Vermont will adopt these recommended criteria into water quality standards. The draft aquatic life criteria are significantly higher than the interim drinking water health advisory EPA issued in June and the observed PFAS concentrations in Vermont surface waters.

The VTDEC has adopted all pesticide criteria published in EPA updated criteria recommendations under Clean Water Act (CWA) § 304(a). Many of the pesticides included are "legacy" contaminants that are still detected in the environment. EPA provides Aquatic Life Benchmarks for evaluating pesticides detected in surface waters. These benchmarks, however, are not water quality criteria; the

values shown for pesticides are generally the lowest effect concentration reported in toxicity studies reviewed. It would not be appropriate to include or reference these benchmarks within the Vermont Water Quality Standards as they do not reflect current federal standards.

## **Appendix F. WATER QUALITY CLASSIFICATIONS**

### **Comments Requesting Additional Changes:**

42. The general reader who reviews the Draft Rule may not understand that the charts for Appendix F on pages 68 through 93 indicate changes in classification for specific designations. We suggest that the Department write a short explanatory paragraph before this chart to explicitly state that the waters in the chart(s) outline changes in those water bodies such that they do not neatly fall under section (b) or (c) of the Draft Rule's appendix.

*VTDEC Response:* The VTDEC proposes the following in Appendix F:

- (d) The waters listed in the following table are those waters classified as A(1), A(2), or B(1) for one or more designated uses.



THE UNIVERSITY OF  
THE SOUTH ALABAMA  
LIBRARY

THE UNIVERSITY OF  
THE SOUTH ALABAMA  
LIBRARY

THE UNIVERSITY OF  
THE SOUTH ALABAMA  
LIBRARY

THE UNIVERSITY OF  
THE SOUTH ALABAMA  
LIBRARY

THE UNIVERSITY OF  
THE SOUTH ALABAMA  
LIBRARY

THE UNIVERSITY OF  
THE SOUTH ALABAMA  
LIBRARY

Contents

Subchapter 1. APPLICABILITY, DEFINITIONS, AND POLICIES..... 4

    § 29A-101 Applicability ..... 4

    § 29A-102 Definitions ..... 5

    § 29A-103 General Policies..... 9

    § 29A-104 Classification of Water Uses ..... 11

    § 29A-105 Antidegradation Policy ..... 12

    § 29A-106 Discharge Policy ..... 13

    § 29A-107 Interpretation..... 15

Subchapter 2. APPLICATION OF STANDARDS ..... 15

    § 29A-201 Sampling and Analysis ..... 15

    § 29A-202 Flow Values Used to Evaluate Compliance with Applicable Numeric Criteria for Rivers, Streams, Brooks, Creeks, and Riverine Impoundments ..... 15~~16~~

    § 29A-203 Nonpoint Source Pollution ..... 16

    § 29A-204 Special Zones..... 17

    § 29A-205 Public Water Source ..... 18

§29A-206 Water Quality Certifications Issued Pursuant to § 401 of the Clean Water Act ..... 18

Subchapter 3. WATER QUALITY CRITERIA ..... 20

    § 29A-301 Natural Influences..... 20

    § 29A-302 Criteria Applicable to Waters Based upon Fish Habitat Designation, Use Classification, or Type of Body of Water ..... 20

    § 29A-303 General Criteria Applicable to all Waters ..... 24

    § 29A-304 Hydrology Criteria..... 25

    § 29A-305 Numeric Biological Indices and Aquatic Habitat Assessments ..... 27

    § 29A-306 Use-specific Management Objectives and Criteria by Class..... 28

§ 29A-307 Classification of Waters.....	35
§ 29A-308 Fish Habitat Designation .....	35
Appendix A. FISH HABITAT DESIGNATION.....	35
§ A-01 Warm Water Fish Habitat.....	35
§ A-02 Cold Water Fish Habitat.....	41
Appendix B. DESCRIPTION OF LAKE CHAMPLAIN AND LAKE MEMPHREMAGOG SEGMENTS FOR APPLICATION OF PHOSPHORUS CRITERIA .....	42
Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA.....	44
Appendix D. CONVERSION FACTORS FOR ESTIMATING DISSOLVED METALS FROM TOTAL VALUES.....	65
Appendix E. PARAMETERS FOR CALCULATING FRESHWATER TOTAL METALS CRITERIA THAT ARE HARDNESS DEPENDENT.....	66
Appendix F. WATER QUALITY CLASSIFICATIONS.....	67
Appendix G. APPLICATION OF BIOCRITERIA FOR FISH AND MACROINVERTEBRATE COMMUNITIES IN VERMONT WADEABLE STREAMS AND RIVERS.....	100
Appendix H. OUTSTANDING RESOURCE WATERS.....	115

## Subchapter 1. APPLICABILITY, DEFINITIONS, AND POLICIES

### § 29A-101 Applicability

- (a) Pursuant to 10 V.S.A. Chapter 47, after the use classification of any water has been established, that water shall be managed by the Secretary in order to obtain and maintain the classification for that use. The Secretary may enforce a classification and these rules against any person affected thereby who, with notice of the classification, has failed to comply.
- ~~(b) Concerning any application, the Water Quality Standards in effect at the time of the filing shall apply. These Water Quality Standards shall apply to those applications, including applications for the renewal of existing approvals, that are filed on or after the date upon which the amended standards become effective, and to all other activities that occur after that date.~~
- (b) The applicable Water Quality Standards shall be those in effect at the time of final permit or certification issuance. Concerning Water Quality Certification for a License, or the renewal of a License, issued by the Federal Energy Regulatory Commission (FERC), the applicable Water Quality Standards shall be those in effect at the time that the FERC issues notice of application ready for environmental analysis for a License.
- (c) These rules shall apply to all “waters,” as defined in these rules, including “waters of the United States” as defined in titles 33 and 40 of the Code of Federal Regulations. These rules shall apply to wetlands as articulated in Sections §§ 29A-104(e) and 29A-105(e). Application of these rules to waters shall not require the issuance of a state or federal permit, license, certification, or approval for discharges or activities for which no such permit, license, certification, or approval requirement exists under applicable state or federal law, including discharges and activities that satisfy the exemptions and exclusions set forth at 40 C.F.R. §§ 122.3 and 232.3.
- (ed) -In the event any of these rules, or any portion thereof, is found by a court of competent jurisdiction to be illegal or void, the remainder thereof shall be deemed unaffected and shall continue in full force and effect.
- (de) -The following exclusions apply only to artificial bodies of water that were not originally created in waters or did not result from impoundment of waters:
- (1) Off stream reservoirs (such as snowmaking ponds) may be subject to water level fluctuations that are necessary to achieve the purposes for which the reservoir was constructed and accordingly, shall not be required to meet the criteria of these rules impacted by water level fluctuations in the reservoir;
  - (2) Waste treatment systems (including waste management systems constructed as part of Best Management Practices under 6 V.S.A. Chapter 215 and treatment ponds, lagoons, or wetlands created solely to meet the requirements of a permit issued for a discharge) determined to be necessary to achieve compliance with these rules shall not be required to be managed as waters under these rules.

- (ef) -Waters created exclusively by rainfall or snowmelt events, such as puddles and overland flow, that are so temporary in nature that they do not support the existing and designated uses, shall not be considered waters.

#### § 29A-102 Definitions

For the purposes of these Water Quality Standards, the terms below shall have the following meanings unless a different meaning clearly appears from the context.

- (1) ~~“Required agricultural practices (RAPs) or acceptable management practices for maintaining water quality on logging jobs (AMPs)” means those land management practices adopted by the Secretary of Agriculture, Food and Markets, and Commissioner of Forests, Parks and Recreation, respectively, in accordance with applicable state law.~~
- (21) “Act” means the “Vermont Water Pollution Control Act” at 10 V.S.A. Chapter 47.
- (32) “Applicable water quality criteria” means all criteria specified in Subchapter 3 that are applicable to a water and the classification of its uses.
- (43) “Application” means any request for a permit required by state or federal law when filed with, and deemed complete by, the reviewing authority.
- (54) “Aquatic biota” means all organisms that, as part of their natural life cycle, live in or on waters.
- (65) “Aquatic habitat” means the physical, chemical, and biological components of the water environment.
- (76) “Assimilative capacity” means a measure of the capacity of the receiving waters to assimilate wastes without lowering their quality below the applicable water quality criteria.
- (87) “Best management practices (BMPs)” means a practice or combination of practices that may be necessary, in addition to any applicable RAPs or AMPs, to prevent or reduce pollution from nonpoint source wastes to a level consistent with the applicable provisions of these rules.
- (98) “Biological integrity” means the ability of a body of water to support and maintain a community of organisms that has the expected species composition, diversity, and functional organization comparable to that of the water in its natural condition.
- (109) “Classification” means the water quality classification attributed to a designated use for a body of water in accordance with the provisions of 10 V.S.A. §§ 1252 and 1253.
- (1110) “Designated use” means any value or use, whether presently occurring or not, for which a water has been designated as Class A(1), A(2), B(1), or B(2).
- (1211) “Discharge” means the placing, depositing, or emissions of any wastes, directly or indirectly, into an injection well or into waters.
- (1312) “EPA or USEPA” means the U.S. Environmental Protection Agency.

- (1413) "Equilibrium condition" means the condition in which water flow, sediment, and woody debris are transported in a watershed in such a manner that the stream maintains its dimension, pattern, and profile without unnaturally aggrading or degrading the channel bed elevation at the stream reach scale.
- (1514) "Existing discharge" means any discharge to the extent authorized by a valid permit issued under the provisions of 10 V.S.A. §§ 1263 or 1265 as of January 7, 1985.
- (1615) "Existing use" means a use that has actually occurred on or after November 28, 1975, in or on waters, regardless of whether or not the use is presently occurring or included in these rules.
- (1716) "Flow characteristics" means the depth, volume, velocity, and variation of streamflow that, in part, determine stream processes, physical habitat structure, and aquatic habitat quality in channels and floodplains as governed by factors associated with valley setting, geology, and climate.
- (1817) "Full support of uses" means the achievement of the level of water quality necessary to consistently maintain and protect existing and designated uses and the achievement of management objectives consistent with the classification level for designated uses.
- (1918) "Functional component" means a portion of the aquatic biological community identified by its role in the processing of energy within the aquatic ecosystem (e.g., primary producers, detritivores, benthic insectivores and predators, etc.).
- (2019) "Groundwater" means water below the land surface.
- (2120) "Indirect discharge" means any discharge to groundwater, whether subsurface, land-based, or otherwise.
- (2221) "Intolerant aquatic organisms" means those organisms that are particularly sensitive to, and likely to be adversely affected by, the stress of pollution, flow modification, or habitat alteration (e.g., mayflies, stoneflies, and Brook Trout).
- (2322) "Low median monthly flow" means the median monthly flow for that month having the lowest median monthly flow.
- (2423) "Mean daily flow" means the arithmetic mean of the sum of individual flow values measured over a calendar day that is representative of the total flow over that 24-hour period.
- (2524) "Median monthly flow" means, for a given calendar month, the mean daily flow that is equaled or exceeded 50 percent of the time, based on a long-term record.
- (2625) "Median annual flow" means that mean daily flow that is equaled or exceeded 50 percent of the time.
- (2726) "Mixing zone" means a length or area within waters required for the dispersion and dilution of waste discharges adequately treated to meet federal and state treatment requirements and within which it is recognized that specific water uses or water quality criteria associated with the assigned classification for such waters may not be realized. A mixing zone shall not extend more than 200 feet from the point of discharge. A mixing zone shall not be used to meet water quality criteria for bioaccumulative toxins.



- (2827) “Natural condition” means the range of chemical, physical, and biological characteristics of a body of water that occur with only minimal effects from human influences.
- (2928) “Natural flow regime” means a water’s characteristic pattern of variability in flow rates and water levels, annually, seasonally, and daily, without the influence of artificial flow regulation. This pattern of variability is characterized by the magnitude, frequency, duration, timing, and rate of change of hydrologic conditions.
- (3029) “New discharge” means any discharge not authorized under the provisions of 10 V.S.A. § 1263 as of January 7, 1985 or any increased pollutant loading or demand on the assimilative capacity of the receiving waters from an existing discharge that requires the issuance of a new or amended permit.
- (3130) “Nonpoint source waste” or “nonpoint source pollution” means waste that reaches waters in a diffuse manner from any source other than a point source including overland runoff from construction sites, or as a result of agricultural or silvicultural practices.
- (3231) “Nonpolluting waste” means waste that prior to treatment does not have the potential to impair the condition of waters.
- (3332) “Permit” means a certification, dam order, or other authorization in which during the application review process, compliance with the Vermont Water Quality Standards is evaluated pursuant to applicable state or federal law.
- (3433) “Physical habitat structure” means the diverse combination and complexity of instream forms created within substrate and woody debris on and within the bed and banks of the channel by stream processes and flow characteristics, as well as the portion of the riparian area that supports woody debris recruitment and temperature refuge. Physical habitat structure, in part, determines aquatic habitat quality at the stream reach and stream network scales by providing for all life cycle functions, which include the full set of forms necessary for the provision of and access to cover, overwintering, and temperature refuge and the substrates necessary for feeding and reproduction of aquatic biota and wildlife.
- (3534) “Point source” means any discernable, confined, and discrete conveyance, including any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft, from which either a pollutant or waste is or may be discharged.
- (3635) “Public interest” means that which shall be for the greatest benefit to the people of the State as determined by the Secretary, in accordance with the criteria set forth 10 V.S.A. § 1253(c).
- (3736) “Receiving waters” means all waters adjacent to a discharge, and all downstream or other waters the quality of which may be affected by that discharge.
- (3837) “Reference water body” means a water that represents the natural condition for a specific water body type against which the condition of waters of similar water body type are evaluated.
- (38) “Required agricultural practices (RAPs) or acceptable management practices for maintaining water quality on logging jobs (AMPs)” means those land management practices adopted by

the Secretary of Agriculture, Food and Markets, and Commissioner of Forests, Parks and Recreation, respectively, in accordance with applicable state law.

- (39) “Riparian areas” means the zones of interaction and influence between aquatic and terrestrial ecosystems along streams, rivers, lakes, wetlands, and other bodies of water.
- (40) “Riverine impoundment” means a reach of river or stream subject to the backwater influence of a human-made dam with the water remaining generally within the natural channel.
- (41) “Seven day low flow, ten year return period (7Q10)” means a ~~drought~~-flow equal to the lowest mean flow for seven consecutive days, adjusted to nullify any effects of artificial flow regulation, that has a 10% chance of occurring in any given year.
- (42) “Secretary” means the Secretary of the Agency of Natural Resources or the Secretary’s duly authorized representative.
- (43) “Stream processes” means the hydrologic, bed-load sediment, and large woody debris regimes of a particular stream reach and is a term used to describe stream channel hydraulics, or the erosion, deposition, sorting, and distribution of instream materials by the power of flowing water. Stream processes work toward an equilibrium condition; are governed by flow characteristics, stream morphology, channel roughness, ~~and~~-floodplain connectivity, and the riparian area, which supports woody debris recruitment and temperature refuge; and, in part, determine physical habitat structure and aquatic habitat quality.
- (44) “Tactical basin plan” means a plan prepared by the Secretary for each of Vermont’s 15 basins in conjunction with the basin planning process required by 40 C.F.R. Part 130, 10 V.S.A. Chapter 47, and these rules.
- (45) “Taxonomic component” means a portion of the biological community identified by a hierarchical classification system for identifying biological organisms that uses physical and biological characteristics (e.g., Insecta: Plecoptera: Perlidae: Agnetina capitate).
- (46) “Thirty day low flow, ten year return period (30Q10)” means a flow equal to the lowest mean flow for 30 consecutive days, adjusted to nullify any effects of artificial flow regulation, that has a 10% chance of occurring in any given year.
- ~~(4647)~~ “Tolerant aquatic organisms” means organisms (e.g., rattail maggots, annelids, Creek Chubs) that, although they may be affected by the stress of pollution, flow modification or habitat alteration, are less sensitive and less likely to be adversely affected than are intolerant aquatic organisms.
- ~~(4748)~~ “Toxic substances” means those wastes and combinations of wastes that, after discharge and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of available information cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological or reproductive malfunctions, or physical deformations in such organisms or their offspring.
- ~~(4849)~~ “Waste” means effluent, sewage, or any substance or material, liquid, gaseous, solid or radioactive, including heated liquids, whether or not harmful or deleterious to waters;

provided however, the term “sewage” as used in 10 V.S.A. Chapter 47 shall not include the rinse or process water from a cheese manufacturing process.

- (4950) “Waste management zone” means a specific reach of Class B(1) or B(2) waters designated by a permit to accept the discharge of properly treated wastes that prior to treatment contained organisms pathogenic to human beings. Throughout the receiving waters, water quality criteria must be achieved, but increased health risks exist in a waste management zone due to the authorized discharge.
- (5051) “Waters” include all rivers, streams, creeks, brooks, reservoirs, ponds, lakes, springs and all bodies of surface waters, artificial or natural, which are contained within, flow through, or border upon the State or any portion of it.
- (5152) “Watershed” means a region containing waters that drain into a particular brook, stream, river, or other body of water.
- (53) “Wetland” means those areas of the state that are inundated by surface or groundwater with a frequency sufficient to support significant vegetation or aquatic life that depend on saturated or seasonally saturated soil conditions for growth and reproduction. Such areas include marshes, swamps, sloughs, potholes, fens, river and lake overflows, mud flats, bogs, and ponds, but excluding such areas as grow food or crops in connection with farming activities (10 V.S.A. § 902(5)).

#### § 29A-103 General Policies

(a) These rules are intended to achieve the goals of the State’s ~~water quality policy~~ Water Quality Policy (10 V.S.A. § 1250), set forth below, as well as the objective of the federal Clean Water Act (33 U.S.C. § 1251 et seq.) which is to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.

~~(b)(1)~~ Water Quality Policy. It is the policy of the State of Vermont to:

- ~~(A)(1)~~ protect and enhance the quality, character, and usefulness of its surface waters and to assure the public health;
- ~~(2)(B)~~ maintain the purity of drinking water;
- ~~(3)(C)~~ control the discharge of wastes to waters, prevent degradation of high quality waters, and prevent, abate, or control all activities harmful to water quality;
- ~~(4)(D)~~ assure the maintenance of water quality necessary to sustain existing aquatic communities;
- ~~(5)(E)~~ provide clear, consistent, and enforceable standards for the permitting and management of discharges;
- ~~(F6)~~ protect from risk and preserve in their natural state certain high quality waters including fragile high-altitude waters, and the ecosystems they sustain;

- (7) ~~G~~—manage waters to promote a healthy and prosperous agricultural community, to increase the opportunities for use of the State’s forest, parks, and recreational facilities, and to allow beneficial and environmentally sound development; and-
- (28) ~~It is further the policy of the State to seek over the long term to upgrade the quality of waters and to reduce existing risks to water quality.~~
- (c) Water Conservation Policy. Water is a natural resource that should be managed efficiently to reduce waste through promotion of water conservation. It shall be the policy of the State to conserve the water resources of Vermont through technology, methods, and procedures designed to promote efficient use of water; to consider water conservation in all water use decisions; and to reduce or minimize the waste of water through water supply management practices.
- (d) Riparian Policy. The State of Vermont recognizes the importance of conserving riparian areas adjacent to surface waters for their important physical, hydrological, and ecological functions, including water temperature moderation; sediment and nutrient filtration and retention; large wood and organic material recruitment and retention; streambank, shoreland, and floodplain stability; and the provision of habitat and travelways for a wide variety of species.
- (e) Tactical Basin Planning.
- (1) Pursuant to 10 V.S.A. § 1253, the Secretary is required to adopt tactical basin plans. Such plans inventory the existing and potential causes and sources of pollution that may impair the waters. Tactical basin plans establish a strategy to improve or restore waters, and to ensure full support of uses. Tactical basin plans serve as the guide, consistent with applicable state and federal law, for how various sources of pollution within each basin will be managed in order to achieve compliance with these rules. The Secretary is required by state law to revise all 15 tactical basin plans on a five-year rotating basis.
- (2) As part of the tactical basin planning process, public participation shall be sought to identify and inventory problems, solutions, high quality waters, existing uses and the quality of such uses, and significant resources of high public interest.
- (3) In preparing tactical basin plans, the Secretary shall, to the extent required by applicable law, consider all relevant aspects of approved municipal plans and regional plans adopted under 24 V.S.A. Chapter 117 and coordinate and cooperate with the Secretary of the Agency of Agriculture, Food and Markets as provided for in 6 V.S.A. Chapter 215.
- (4) Each tactical basin plan shall identify strategies, where necessary, by which to allocate levels of pollution between various sources as well as between individual discharges. Tactical basin plans shall, to the extent appropriate, contain specific recommendations by the Secretary that include the identification of all known existing uses, any recommended changes in classification and designation of waters, including reclassifying waters’ uses from Class B(2) to a higher classification level and designating waters as Outstanding Resource Waters, schedules and funding for

remediation, stormwater management, riparian zone management, and other measures or strategies pertaining to the enhancement and maintenance of the quality of waters within the basin.

- (5) Upon adoption of a tactical basin plan, the Secretary shall promptly initiate rulemaking and shall give due consideration to the recommendations contained in the tactical basin plan.

(f) Hydrology Policy.

- (1) The proper management of water resources now and for the future requires careful consideration of the interruption of the natural flow regime and the fluctuation of water levels resulting from the construction of new, and the operation of existing, dams, diversions, and other control structures. These rules, in conjunction with other applicable law, provide a means for determining conditions which preserve, ~~to the extent practicable,~~ the natural flow regime of waters.
- (2) When determining necessary streamflows or conditions necessary to further the goals of this policy through application of the applicable ~~Agency of Natural Resources~~ procedures or regulations, the Secretary, as provided for in 10 V.S.A. § 1003, may cooperate with appropriate federal, state, municipal, and private interests ~~in achieving voluntary agreements relating to artificial streamflow regulation that~~ to assure consistency with these rules.

§ 29A-104 Classification of Water Uses

- (a) Uses for waters are classified separately. A body of water may be assigned different classifications for different uses. For each use, management objectives and associated criteria for those objectives are presented by classification level in § 29A-306 of these rules.
- (b) All waters of the State shall be managed to support their designated and existing uses. Existing classifications of water uses shall be maintained unless reclassified in a manner consistent with the Act and in compliance with all applicable federal requirements, including 40 C.F.R. § 131.10(g).
- (c) Recommendations for use reclassification shall be made during the tactical basin planning process or by the Department of Environmental Conservation on a case-by-case basis. Pursuant to 10 V.S.A. § 1253, on the Secretary's own motion, or on receipt of written request that the Secretary adopt, amend, or repeal a reclassification rule, the Secretary shall comply with 3 V.S.A. § 806 and may initiate a rulemaking proceeding to reclassify one or more uses of all or any portion of the affected waters in the public interest.
- (d) The designated uses are:
  - (1) Aquatic biota and wildlife that may utilize or are present in the waters;
  - (2) Aquatic habitat to support aquatic biota, wildlife, or plant life;
  - ~~—(63) The use of waters for the enjoyment of aesthetic conditions;~~

- ~~(3) The use of waters for swimming and other primary contact recreation;~~
  - (44) The use of waters for boating and related recreational uses;
  - ~~(55) The use of waters for fishing and related recreational uses;~~
  - ~~(6) The use of waters for the enjoyment of aesthetic conditions;~~
  - (6) The use of waters for swimming and other primary contact recreation;
  - (7) The use of the water for public water source; and
  - (8) The use of water for irrigation of crops and other agricultural uses.
- (e) For all Class I and II wetlands, as defined in 10 V.S.A. § 902, the uses to be protected include the functions and values of the wetland as described in Section 5 of the Vermont Wetland Rules.

#### § 29A-105 Antidegradation Policy

- (a) General. All waters shall be managed in accordance with these rules to protect, maintain, and improve water quality.

(b) Protection and Determination of Existing Uses.

Existing uses of waters and the level of water quality necessary to protect those existing uses shall be maintained and protected regardless of the water's classification. Determinations of what constitute existing uses of particular waters shall be made either during the basin planning process or on a case-by-case basis during consideration of an application. The use of waters to receive or transport discharges of waste shall not constitute an existing use for purposes of these rules. ~~In making a determination~~ ef~~determining~~ the existing uses to be protected and maintained under this section and all other sections of these rules, the Secretary shall consider the designated uses, and at least the following factors:

- (1) Aquatic biota and wildlife that utilize or are present in the waters;
- (2) Habitat that supports or is capable of supporting aquatic biota, wildlife, or plant life;
- (3) The use of the waters for recreation or fishing;
- (4) The use of the water for public water source, or commercial activity that depends directly on the preservation of an existing high level of water quality; and
- (5) For factors (1) and (2) above, evidence of the use's ecological significance in the functioning of the ecosystem or evidence of the use's rarity.

(c) Protection and Maintenance of High Quality Waters.

- (1) Waters the existing quality of which exceeds any applicable water quality criteria provide important environmental, economic, social, and other benefits to the people of the State. Except as provided in subdivision (2) of this subsection, such waters shall be managed to maintain and protect the higher water quality and minimize risk

to existing and designated uses. In all cases, the level of water quality necessary to maintain and protect all existing uses as well as applicable water quality criteria shall be maintained.

- (2) A limited reduction in the existing higher quality of such waters may be allowed only when it is shown that:
    - (A) through the applicable permitting or approval process, the Secretary has provided public notice of the draft decision and an opportunity for public comment on the decision;
    - (B) after an analysis of alternatives, allowing lower water quality is necessary to prevent substantial adverse economic or social impacts on the people of the State; and
    - (C) there shall be achieved the highest statutory and regulatory requirements for all new or existing point sources, and all cost effective and reasonable best management practices for nonpoint source control, consistent with state law.
  - (3) The analysis of alternatives required under subdivision (c)(2)(B) of this subsection shall evaluate a range of alternatives that would prevent or lessen the degradation associated with the proposed activity. When the analysis identifies one or more practicable alternatives, the Secretary shall only find that a lowering is necessary if one such practicable alternative is selected for implementation. For purposes of this section, “practicable” means technologically possible, able to be put into practice, and economically viable.
  - (4) To the extent any reduction in the quality of high quality waters is allowed, such reduction shall be limited to that which complies with subdivision (c)(2) of this subsection.
- (d) Protection of Outstanding Resource Waters. The Secretary may under 10 V.S.A. § 1424a designate certain waters as Outstanding Resource Waters. Outstanding Resource Waters are listed in Appendix H of these rules. Where the Secretary so designates such waters for specific exceptional natural, recreational, cultural, or scenic values, their existing quality, associated with the values for which they have been designated, shall, at a minimum, be protected and maintained.
- (e) Protection of Wetlands. Wetlands and their functions and values shall be protected as described by the Vermont Wetland Rules.

#### § 29A-106 Discharge Policy

- (a) Discharge Criteria. In addition to the other provisions of these rules, new discharges of wastes may be allowed only when all the following criteria are met:
  - (1) The proposed discharge is in conformance with all applicable provisions of these rules including the classification of the receiving waters adopted by the Secretary as set forth in Appendix F of these rules.

- (2) There is neither an alternative method of waste disposal, nor an alternative location for waste disposal, that would have a lesser impact on water quality including the quality of groundwater, or if there is such an alternative method or location, it would be clearly unreasonable to require its use.
  - (3) The design and operation of any waste treatment or disposal facility is adequate and sufficiently reliable to ensure the full support of uses and to ensure compliance with these rules and with all applicable state and federal treatment requirements and effluent limitations.
  - (4) Except as provided for in 10 V.S.A. § 1259(d) and (f), the discharge of wastes other than nonpolluting wastes and stormwater runoff is prohibited in Class A(1) and A(2) waters regardless of the degree of treatment provided.
  - (5) Except as provided for in 10 V.S.A. § 1259, the discharge of wastes that, prior to treatment, contained organisms pathogenic to human beings into waters is prohibited.
  - (6) The receiving waters will have sufficient assimilative capacity to accommodate the proposed discharge.
  - (7) Assimilative capacity has been allocated to the proposed discharge consistent with the classification set forth in Appendix F of these rules.
  - (8) The discharge of wastes to the thermocline or hypolimnion of any lake in manner that may prevent the full support of uses is prohibited.
  - (9) The discharge of sewage into Class B(1) or B(2) waters shall not pose more than a negligible risk to public health. Compliance with this criterion shall include an assessment of both the level and reliability of treatment achieved and the impact of the discharge on the water quality of the receiving waters.
- (b) Assimilative Capacity. The capacity of waters to assimilate both the discharge of wastes and the impact of other activities that may adversely affect water quality, and at the same time to be maintained at a level of water quality that is compatible with their classification, is finite. The Secretary may hold a portion of the assimilative capacity in reserve to provide for future needs, including the abatement of future sources of pollution and future social and economic development. Accordingly, the assimilative capacity of waters shall be carefully allocated in accordance with the "Wasteload Allocation Process" as adopted by the Secretary.
- (c) Compliance Schedules. A permit issued pursuant to Vermont's federally-delegated National Pollutant Discharge Elimination System (NPDES) program may, when appropriate, specify a schedule leading to compliance with the Vermont and Federal Clean Water Acts and regulations. The purpose of a schedule of compliance generally is to afford a permittee adequate time to comply with one or more permit requirements or limitations that are based on new, newly interpreted or revised water quality standards that became effective after both issuance of the initial permit for a discharge and July 1, 1977. For a permit requirement or limitation that is based on such a new, newly interpreted, or revised water quality standard, the Secretary may include a schedule of compliance in a permit at the time of permit reissuance or modification where the



permittee either cannot comply with the permit requirement or limitation, or there is insufficient information available to determine whether the permittee can comply with the permit requirement or limitation. A schedule of compliance shall require compliance at the earliest possible time, as determined by the Secretary. A schedule of compliance shall include dates for specified tasks or activities leading to compliance and may include interim effluent limitations, as the Secretary deems appropriate. This provision does not limit the Secretary's authority to include compliance schedules in permits as provided by state law.

#### § 29A-107 Interpretation

The Secretary may issue declaratory rulings regarding the water quality standards pursuant to 10 V.S.A. § 1252(f).

### Subchapter 2. APPLICATION OF STANDARDS

#### § 29A-201 Sampling and Analysis

All numeric water quality criteria shall be applied by rounding to the nearest significant number in accordance with standard mathematic practice. For the purposes of these rules, sample collection, preservation, handling and analysis shall conform as closely as practicable to methods established in the most current edition or publication of any of the following sources:

- (1) "Standard Methods ~~f~~For the Examination of Water and Wastewaters," Public Health Association, New York.
- (2) "American Society for Testing and Materials," part 23, "Water; Atmospheric Analysis," American Society for Testing and Materials.
- (3) "Methods for Chemical Analysis of Water and Wastes," U.S. Environmental Protection Agency.
- (4) "Microbiological Methods for Monitoring the Environment - Water and Wastes," U.S. Environmental Protection Agency.
- (5) The "Quality Assurance Program and Project Plan" prepared by the Secretary and as approved by EPA.
- (6) Any applicable practice or procedure adopted by the Secretary under the provisions of 3 V.S.A. § 835 or any rule adopted as part of the "Vermont Water Pollution Control Permit Regulations" under the provisions of 3 V.S.A. § 836.
- (7) Any applicable practices or procedures adopted by the Secretary for conducting nonpoint source pollution monitoring. Such procedures shall be adopted after public notice and comment. Until such procedures are adopted, nonpoint source pollution monitoring shall be conducted in accordance with generally accepted scientific monitoring or evaluation methodologies which the Secretary determines to be appropriate.

#### § 29A-202 Flow Values Used to Evaluate Compliance with Applicable Numeric Criteria for Rivers, Streams, Brooks, Creeks, and Riverine Impoundments

- (a) Natural Flow Regime. Where the natural flow regime is not altered or substantially influenced by any human-made structure or device, compliance with the applicable numeric water quality criteria shall be calculated on the basis of the 7Q10 flow value unless an alternate flow statistic is specified in Section 3-01 of these rules. This rule shall not be construed to allow less than normal design operation of any treatment facility during periods of low streamflow or to otherwise waive the terms of any permit.
- (b) Natural Flow Regime Altered by Human-made Structures.
- (1) Where there is a Minimum Flow Agreement or requirement. For waters where the natural flow regime is altered by a human-made structure and where a minimum flow agreement or requirement has been established under 10 V.S.A. § 1003 or pursuant to a Section 401 Water Quality Certification, issued pursuant to the “Vermont Water Pollution Control Permit Regulations”, compliance with the applicable numeric water quality criteria shall be calculated on the basis of the 7Q10 flow value or at the agreed/required minimum flow, whichever is less, unless an alternative flow statistic is specified in § 29A-304 of these rules.
- (2) Where there is no Minimum Flow Agreement or requirement. For waters where the natural flow regime is altered by human-made structures and where no minimum flow agreement or requirement has been established, compliance with the applicable numeric water quality criteria shall be calculated on the basis of the 7Q10 flow value or at the absolute low flow resulting from flow regulation, whichever is less, unless an alternative flow statistic is specified in § 29A-304 of these rules.

#### § 29A-203 Nonpoint Source Pollution

(a) Policy.

- (1) The State of Vermont recognizes that certain wastes from nonpoint sources, including nonpoint source waste from agricultural or silvicultural activities, are of such a nature that strategies required by the Act or by 6 V.S.A. Chapter 215, and those strategies developed in the tactical basin planning process, represent a practicable basis for achieving compliance with these rules.
- (2) In implementing subdivision (a)(1) of this subsection, the Secretary and the Secretary of the Agency of Agriculture, Food and Markets are encouraged to exercise the full range of discretion authorized by the Act and 6 V.S.A. Chapter 215 and to manage discharges of nonpoint source waste in a practical and cost-effective manner, consistent with the provisions of these rules.

(b) Use of Management Practices and Planning.

- (1) The requirements of these rules for any activity causing a nonpoint source discharge shall be presumed to be satisfied when the activity is in compliance with the RAPs, if applicable; is in compliance with the AMPs, if applicable; or is in compliance with BMPs required by statute, rule, permit, order, or other legally enforceable mechanism.

- (2) Any presumption provided by this section shall be negated when a water quality analysis conducted according to § 29A-201(7) of these rules demonstrates that there is a violation of these rules.

#### § 29A-204 Special Zones

##### (a) Mixing Zones.

- (1) Designation. Mixing zones shall not be created in any Class A(1) or A(2) water. In Class B(1) and B(2) waters the Secretary may, in conjunction with the issuance of a permit, designate a specific portion of the receiving waters not exceeding 200 feet from the point of discharge as a mixing zone for any waste that has been properly treated to comply with all applicable state and federal treatment requirements and effluent limitations. Within any mixing zone the Secretary may, in accordance with the terms of a permit, waive specific provisions of §§ 29A-105, 302, 303, and 306 of these rules when consistent with the criteria in subdivision (2) of this subsection, provided that the quality of the waters outside of the mixing zone complies with all applicable provisions of these rules.
- (2) Mixing Zone Criteria. The Secretary shall ensure that conditions due to discharges of waste within any mixing zone shall:
  - (A) Not result in a significant increase in public health risk when evaluated using reasonable assumptions about exposure pathways;
  - (B) Not constitute a barrier to the passage or movement of fish or prevent the full support of aquatic biota, wildlife, and aquatic habitat uses in the receiving waters outside the mixing zone;
  - (C) Not kill organisms passing through the mixing zone;
  - (D) Protect and maintain the existing uses of the waters;
  - (E) Be free from materials in concentrations that settle to form objectionable deposits;
  - (F) Be free from floating debris, oil, scum, and other material in concentrations that form nuisances;
  - (G) Be free from substances in concentrations that produce objectionable color, odor, taste, or turbidity; and
  - (H) Be free from substances in concentrations that produce undesirable aquatic life or result in a dominance of nuisance species.

##### (b) Waste Management Zones.

- (1) Designation. The designation of waste management zones is provided for in 10 V.S.A. § 1252(b)-(d). In Class B(1) and B(2) waters the Secretary may, in conjunction with the issuance of a permit for the direct discharge of properly treated wastes that prior to treatment contained organisms pathogenic to human beings, designate a specific portion of the receiving waters as a waste management zone when the criteria in subdivision (2) of this subsection are met. Waste management

zones shall not be created in any Class A(1) or A(2) water. Within such zones, all water quality criteria shall be met.

- (2) Waste Management Zone Criteria. The Secretary shall ensure that, in addition to complying with all other applicable provisions of the statute and these rules, any waste management zone meets the following criteria:
- (A) It shall be the minimum length necessary to accommodate the authorized discharge;
  - (B) It shall be consistent with the Antidegradation Policy, § 29A-105 of these rules;
  - (C) It shall not result in significantly increased health risks when evaluated using reasonable assumptions about exposure pathways;
  - (D) It will be located and managed so as to not result in more than a negligible increased risk to public health adjacent to or downstream of the waste management zone; and
  - (E) It will not constitute a barrier to the passage or movement of fish or prevent the full support of aquatic biota, wildlife, and aquatic habitat uses.

#### § 29A-205 Public Water Source

- (a) Designation. In accordance with 10 V.S.A. § 1252, waters that are managed for the purpose of public water sources may be designated in Appendix F as Class A(2) Public Water Sources.
- (b) Public Water Source Management. In accordance with 10 V.S.A. § 1250, it is the policy of the State of Vermont that public water sources shall be managed in a manner that assures compliance with these rules. The Secretary is encouraged to exercise the full range of discretion consistent with 10 V.S.A. Chapters 47 and 56 to manage public water sources to achieve such compliance.

#### § 29A-206 Water Quality Certifications Issued Pursuant to § 401 of the Clean Water Act

- (a) Section 401 of the CWA requires that for any federally licensed or permitted activity that may result in a discharge into waters of the United States, the State issue, waive, or deny water quality certification ensuring the discharge will comply with all applicable water quality requirements (33 U.S.C. § 1341).
- (b) A water quality certification shall not be issued unless the applicant demonstrates all of the following:
  - (1) There is no practicable alternative to the proposed activity that would have a less adverse impact on waters and wetlands of the State, and provided that any proposed alternative shall not have other significant adverse human health, safety, or environmental consequences. An alternative is considered practicable if it is available and capable of being completed after taking into consideration cost, existing technology, and logistics in light of overall purposes of the proposed activity.

- (A) Projects that are not likely to have significant impacts on water quality or wetland functions or values; railroad projects; or State or municipal road or highway projects do not require an analysis of practicable alternatives.
- (B) Failure to comply with the requirements of this section shall not be the basis for denial of an application for a certification under Section 401 of the Clean Water Act if the proposed activity is exempt from those requirements under a rule adopted by the Secretary.
- (2) There is reasonable assurance that the discharge will not result in a violation of these rules, including any applicable water quality criteria and the Anti-degradation policy articulated in these rules.
- (c) Any certification issued by the State shall establish conditions necessary to ensure that the federally licensed or permitted activity will comply with these rules, as well as with any other appropriate requirement of state law, including:
- (1) 10 V.S.A. chapter 37 (wetlands protection and water resources management);
  - (2) 10 V.S.A. chapter 41 (regulation of stream flow);
  - (3) 10 V.S.A. § 1264 (stormwater management);
  - (4) 29 V.S.A. chapter 11 (management of lakes and ponds); and
  - (5) The Agency of Natural Resources Rules for Water Withdrawals for Snowmaking.
- (d) The Secretary may issue a certification required by this subsection to any general permit or authorization issued by a federal agency. An applicant's compliance with that federal permit or authorization shall be presumed to be in compliance with the certification unless the Secretary determines that an individual review of the applicant's activity is necessary to assure compliance with the Vermont Water Quality Standards and other appropriate State laws.
- (e) Public noticing of § 401 Water Quality Certification application, draft decision, and final decision.
- (1) The applicant shall provide notice of their § 401 Water Quality Certification application to any person or adjoining property owner that receives notice of the federal license or permit application for which the § 401 Water Quality Certification is sought. Adjoining property owners are those whose property adjoins the waterbody or aquatic site where the work is being proposed.
  - (2) The Secretary shall provide notice of an administratively complete application through the environmental notice bulletin.
  - (3) The Secretary shall provide notice of the draft decision through the environmental notice bulletin and shall post the draft decision to the bulletin.
  - (4) The Secretary shall provide a public comment period of no less than 30 days.
  - (5) Any person may request a public meeting on the draft decision issued under this section within 14 days of the issuance of the draft decision. The Secretary shall hold a public meeting whenever any person files a written request for such a meeting. The Secretary otherwise may hold a public meeting at his or her discretion.

(6) The Secretary shall provide at least 14 days' notice of the public meeting through the environmental notice bulletin. If the notice of the public meeting is not issued at the same time as the draft decision or draft general permit, the Secretary also shall provide notice of the public meeting in the same manner as required for the draft decision or permit.

(7) The Secretary shall provide notice of the final decision through the environmental notice bulletin and shall post the final decision or permit to the bulletin. When the Secretary issues the final decision, the Secretary shall provide a response to comments.

### Subchapter 3. WATER QUALITY CRITERIA

#### § 29A-301 Natural Influences

Waters in which one or more applicable water quality criteria are not met due to natural influences shall not be considered to be in noncompliance with respect to such criteria. In such waters, activities may be specifically authorized by a permit, provided that those activities do not further reduce the quality of the receiving waters and would comply with all other applicable criteria.

#### § 29A-302 Criteria Applicable to Waters Based upon Fish Habitat Designation, Use Classification, or Type of Body of Water

The following water quality criteria shall be achieved in waters, as specified below:

(1) Temperature.

(A) General. The change or rate of change in temperature, either upward or downward, shall be controlled to ensure full support of aquatic biota, wildlife, and aquatic habitat uses. For the purpose of applying this criterion, ambient temperature shall mean the water temperature measured at a control point determined by the Secretary to be outside the influence of a discharge or activity.

(B) Cold Water Fish Habitat. Waters that are cold water fish habitat shall meet the following standards, as applicable, except as provided for in subdivision (D) of this subsection.

(i) Class A(1) Waters for Fishing. No increase in ambient temperature from the natural condition.

(ii) Class B(1) Waters for Fishing.

(I) If the maximum temperature is below 68°F as a rolling seven-day mean of maximum daily water temperatures for the entire period from June 1 to September 30 of any year, the total increase from the ambient temperature due to all discharges and activities shall not exceed 1.0°F.

(II) If the maximum temperature is above 68°F as a rolling seven-day mean of maximum daily water temperatures for the entire period from June 1 to

September 30 of any year, there shall be no increase in temperature due to all discharges and activities.

(iii) Class A(2) and B(2) Waters for Fishing. The total increase from the ambient temperature due to all discharges and activities shall not exceed 1.0°F.

(C) Warm Water Fish Habitat. The total increase from the ambient temperature due to all discharges and activities shall not exceed the following temperature criteria, except as provided for in subdivision (D) of this subsection.

(i) Lakes, Ponds, and Reservoirs not including Riverine Impoundments.

(I) For waters with an ambient temperature above 60°F, the total temperature change shall not exceed 1°F.

(II) For waters with an ambient temperature between 60°F and 50°F, the total temperature change shall not exceed 2°F.

(III) For waters with an ambient temperature below 50°F, the total temperature change shall not exceed 3°F.

(ii) Rivers, Streams, Brooks, Creeks, and River Impoundments.

(I) For waters with an ambient temperature above 66°F, the total temperature change shall not exceed 1°F.

(II) For waters with an ambient temperature between 63°F and 66°F, the total temperature change shall not exceed 2°F.

(III) For waters with an ambient temperature between 59°F and 62°F, the total temperature change shall not exceed 3°F.

(IV) For waters with an ambient temperature between 55°F and 58°F, the total temperature shall not exceed 4°F.

(V) For waters with an ambient temperature below 55°F, the total temperature change shall not exceed 5°F.

(D) Assimilation of Thermal Wastes. The Secretary may, by permit condition, specify temperature limits that exceed the values specified above in order to authorize discharges of thermal wastes when it is shown that:

(i) The discharge will comply with all other applicable provisions of these rules;

(ii) A mixing zone of 200 feet in length is not adequate to provide for assimilation of the thermal waste; and

(iii) After taking into account the interaction of thermal effects and other wastes, that change or rate of change in temperature will not result in thermal shock or prevent the full support of uses of the receiving waters.

(2) Phosphorus.

- (A) In all waters, total phosphoreous loadings shall be limited so that they will not contribute to the acceleration of eutrophication or the stimulation of the growth of aquatic biota in a manner that prevents the full support of uses.
- (B) For lakes, ponds, or reservoirs that have drainage areas of less than 40 square miles and a drainage area to surface area ratio of less than 500:1, and their tributaries:
- (i) In addition to compliance with subdivision (A) of this subsection, there shall be no significant increase over currently permitted phosphorus loadings. Discharges to tributaries shall not increase in-stream conditions by more than 0.001 mg/l at low median monthly flow. Indirect discharges to lakes, ponds, or reservoirs shall not increase total dissolved phosphorus as measured in the groundwater 100 feet from the mean water level of the lake, pond, or reservoir by more than 0.001 mg/l.
  - (ii) Applicable basin plans, other applicable plans, permit limitations, and other measures adopted or approved by the Secretary, may define “no significant increase” so as to allow new or increased discharges of phosphorus, only when the permit for such discharges provides for a corresponding reduction in phosphorus loadings to the receiving waters in question.
- (C) For Lake Champlain and Lake Memphremagog. All discharges into each of the lake segments identified in Table 1, or into tributaries within the basin, shall comply with the applicable Total Maximum Daily Load (TMDL), tactical basin plans, other applicable plans, permit limitations, and any other measures adopted or approved by the Secretary reasonably designed to achieve the criteria in Table 1.

Table 1. Phosphorus Criteria for Segments Within Lake Champlain and Lake Memphremagog.

Lake Segment (See Appendix B)	Phosphorus Criterion (mg/L as P) <sup>1</sup>
Lake Champlain	
Main Lake	0.010
Malletts Bay	0.010
Burlington Bay	0.014
Shelburne Bay	0.014
Northeast Arm	0.014
Isle LaMotte	0.014
Otter Creek	0.014
Port Henry	0.014
St. Albans Bay	0.017



	Missisquoi Bay	0.025
	South Lake A	0.025
	South Lake B	0.054
Lake Memphremagog		
	Main Lake	0.014
	South Bay	0.025

1. These criteria shall be achieved as the annual mean total phosphorus concentration in the photosynthetic depth (euphotic) zone in central, open water areas of each lake segment.

(3) Nitrates.

- (A) In all waters nitrates shall be limited so that they will not contribute to the acceleration of eutrophication, or the stimulation of the growth of aquatic biota, in a manner that prevents the full support of uses.
- (B) For lakes, ponds, and reservoirs, not including riverine impoundments, levels of nitrate not to exceed 5.0 mg/l as NO<sub>3</sub>-N (nitrate-nitrogen) regardless of classification.
- (C) For rivers and streams, levels of nitrate:
  - (i) Not to exceed 0.20 mg/l, as NO<sub>3</sub>-N at flows exceeding low median monthly flows, in Class A(1) and A(2) waters above 2,500 feet altitude, National Geodetic Vertical Datum.
  - (ii) Not to exceed 2.0 mg/l as NO<sub>3</sub>-N at flows exceeding low median monthly flows, in Class A(1) and A(2) waters at or below 2,500 feet altitude, National Geodetic Vertical Datum.
  - (iii) Not to exceed 5.0 mg/l as NO<sub>3</sub>-N at flows exceeding low median monthly flows, in Class B(1) and B(2) waters.

(4) Turbidity.

- (A) Class A(1) and A(2) Waters for Any Use or Cold Water Fish Habitat. Turbidity levels not to exceed 10 NTU (~~nephelometric~~ nephelometric turbidity units) as an annual average under dry weather base-flow conditions.
- (B) All Other Waters. Turbidity levels not to exceed 25 NTU as an annual average under dry weather base-flow conditions.

(5) Dissolved Oxygen. The dissolved oxygen criteria are instantaneous minimum values.

- (A) Cold Water Fish Habitat.
  - (i) In waters that the Secretary determines are salmonid spawning or nursery areas important to the establishment or maintenance of the fishery resource,

not less than 7 mg/l and 75% saturation at all times, nor less than 95% saturation during late egg maturation and larval development of salmonids.

(ii) All Other Waters. Not less than 6 mg/l and 70% saturation at all times.

(B) Warm Water Fish Habitat. Not less than 5 mg/l and 60% saturation at all times.

#### § 29A-303 General Criteria Applicable to all Waters

The following water quality criteria shall be achieved in all waters, regardless of their classification:

- (1) Sludge deposits or solid refuse. None.
- (2) Settleable solids, floating solids, oil, grease, scum, or total suspended solids. None in such concentrations or combinations that would prevent the full support of uses.
- (3) Taste and Odor. None that would prevent the full support of uses or have an adverse effect on the taste or odor of fish.
- (4) Color. No change from the natural condition that would prevent the full support of uses.
- (5) Alkalinity. No change from the natural condition that would prevent the full support of uses.
- (6) pH. pH values shall be maintained within the range of 6.5 and 8.5. Both the change and the rate of change in pH values shall be controlled to ensure the full support of uses.
- (7) Toxic substances.
  - (A) General criteria. Waters shall be managed to prevent the discharge of toxic substances in concentrations, quantities, or combinations that exceed:
    - (i) For toxic substances that are carcinogenic, a maximum individual lifetime risk to human health greater than  $10^{-6}$ ;
    - (ii) For toxic substances that are noncarcinogenic, a maximum individual lifetime risk of no adverse effect to human health; or
    - (iii) Acute or chronic toxicity to aquatic biota or wildlife.
  - (B) Human health-based criteria.
    - (i) In rivers, streams, brooks, creeks, and riverine impoundments, the human health based toxic pollutant criteria listed in Appendix C shall be applied at the median annual flow for toxic substances that are classified as known, probable, or possible human carcinogens or at the 7Q10 flow for toxic substances that are classified as threshold toxicants (not known or probable carcinogens).
    - (ii) In all other waters, the human health based toxic pollutant criteria listed in Appendix C shall apply at all times.

(C) Aquatic biota-based criteria.

- (i) In rivers, streams, brooks, creeks, and riverine impoundments, the aquatic biota based toxic pollutants criteria that prevent acute or chronic toxicity listed in Appendix C shall be applied at 7Q10 flows. For chronic criteria that utilize 30-day average, 30Q10 flows shall apply. The 30Q10 flow is a biologically based design flow used to protect aquatic life from chronic effects.
- (ii) In all other waters, the aquatic biota based toxic pollutant criteria for acute or chronic toxicity listed in Appendix C shall apply at all times.

(D) Other toxic substances.

- (i) Where numeric criteria for a toxic substance are not established by these rules, the Secretary may establish such criteria consistent with subsection (7) of this section, based on the procedures set forth in the Vermont Toxic Discharge Control Strategy (1994).
- (ii) In establishing such limits, the Secretary shall give consideration to the potential for bio-accumulation as well as any antagonistic or synergistic relationship that may exist between the wastes being discharged and the concentration of other wastes or constituents in the receiving waters.

(8) Radioactive Substances.

- (A) Waters shall be managed to prevent the discharge of radioactive substances in concentrations, quantities, or combinations that may create a significant likelihood of an adverse impact on human health or a risk of acute or chronic toxicity of aquatic biota or wildlife. Unless otherwise required by these rules, the Secretary shall determine limits for discharges containing radioactive substances based on the results of biological toxicity assessments and the appropriate available scientific data, including:
  - (i) The Vermont State Health Regulation, Part 5, Chapter 3 “Radiological Health,” effective as of January 1, 2010.
  - (ii) 10 C.F.R. Part 50, Appendix I.
- (B) The discharge of radioactive substances shall not exceed the lowest limits which are reasonably achievable.

§ 29A-304 Hydrology Criteria

- (a) General. To effectively implement the water conservation and hydrology policies set forth in § 29A-103 of these rules, and to ensure full support of uses, the following hydrology criteria shall be achieved and maintained, where applicable. Where there are multiple activities that affect flow in a watershed, a determination of compliance with the following criteria shall include consideration of the cumulative effects of these activities.
- (b) Streamflow Protection.

- (1) Class A(1) Waters for Aquatic Habitat. Changes from the natural flow regime shall not cause the natural flow regime to be diminished, in aggregate, by more than 5% of 7Q10 at any time;
- (2) Class B(1) Waters for Aquatic Habitat. Changes from the natural flow regime, in aggregate, shall not result in natural flows being diminished by more than a minimal amount provided that all uses are fully supported; and when flows are equal to or less than 7Q10, by not more than 5% of 7Q10. The method for ensuring compliance with this subsection is a site-specific flow study or studies.
- (3) Class A(2) and B(2) Waters for Aquatic Habitat or Recreation – Boating. Any change from the natural flow regime shall provide for maintenance of flow characteristics that ensure the full support of uses and comply with the applicable water quality criteria. The preferred method for ensuring compliance with this subsection is a site-specific flow study or studies. In the absence of ~~site~~-site-specific studies, the Secretary may establish hydrologic standards and impose additional hydrologic constraints, consistent with any applicable Agency of Natural Resources rule or procedure, to ensure compliance with the requirements of this subsection.

(c) Flow Study Requirements.

- (1) Parameters for study-based, site-specific streamflow protection requirements. Site specific studies shall be sufficiently based on scientific knowledge so that the study will aid in the Secretary's consideration of appropriate site-specific flow criteria. In the case of aquatic habitat studies, those methodologies that are acceptable for determining streamflow protection requirements pursuant to this section include ~~the Instream Flow Incremental Methodology (IFIM)~~ hydraulic habitat studies, as well as other comparable methods of evaluation deemed appropriate by the Secretary, provided that such evaluation complies with each of the following requirements:
  - (A) the methodology is tailored to provide information from which to determine the relationship between aquatic habitat and streamflow;
  - (B) the methodology, or the scientific evaluations upon which it is based, have been subjected to peer review and evaluation, and the results of such peer review and evaluation support the conclusion that the methodology is generally acceptable.
- (2) Proposals for developing site-specific flow criteria. When considering proposals for developing site-specific flow criteria in conjunction with review of an application, the Secretary may first require the filing of a study plan that defines the method to be used and provides any study details that the Secretary deems necessary, and, in the case of a study designed to evaluate the relationship between aquatic habitat and streamflow, the Secretary shall make a ruling as to the acceptability of the methodology. The Secretary need not consider any flow study unless the study plans have obtained the Secretary's approval. The plan may include Agency of Natural Resources oversight during study execution and study refinement and modification as the study proceeds. The Secretary should also establish a procedure by which

completeness of the evidence in support of the proposed ~~study-study~~-based flow could be determined prior to the Secretary's determination on the application. If the proposal is determined to be incomplete, or if the methodology which is employed is unacceptable to the Secretary, the Secretary shall issue a written request for the submission of additional evidence, with general instructions to the applicant as to the deficiency of the evidence previously submitted.

(d) Water Level Fluctuations.

- (1) Class A(1) and B(1) Waters for Aquatic Habitat. Manipulation of the water level of lakes, ponds, reservoirs, riverine impoundments, and any other waters shall result in no more than a minimal deviation from the natural flow regime.
- (2) Class A(2) and B(2) Waters for Aquatic Habitat or Recreation – Boating. Lakes, ponds, reservoirs, riverine impoundments, and any other waters may exhibit artificial variations in water level when subject to water level management, but only to the extent that such variations ensure full support of uses.

(e) High Flow Regime.

- (1) Class A(1) and B(1) Waters for Aquatic Habitat. No change from the natural flow regime that would result in more than a minimal impact upon these waters.
- (2) Class A(2) and B(2) Waters for Aquatic Habitat or Recreation – Boating. No change from the natural flow regime that would result in ~~runoff causing a change in the~~ timing or an increase in the frequency, magnitude, rate of change, or duration of peak flows adversely affecting channel integrity or prevent the full support of uses.

§ 29A-305 Numeric Biological Indices and Aquatic Habitat Assessments

- (a) ~~In addition, the Secretary may~~ shall determine whether there is full support of the aquatic habitat use through ~~other~~ appropriate methods of evaluation, including habitat assessments hydrogeomorphic assessments of flow characteristics, physical habitat structure, and stream processes for rivers and streams and aquatic habitat studies for lakes, ponds, and reservoirs. Applicants shall obtain the Secretary's approval of study plans prior to conducting an evaluation.
- (b) In addition to other applicable provisions of these rules and other appropriate methods of evaluation, the Secretary ~~may~~ shall establish and apply numeric biological indices to determine whether there is full support of the aquatic biota ~~and aquatic habitat~~ uses for each class of water. In establishing numeric biological indices, the Secretary shall establish procedures that employ standard sampling and analytical methods to characterize the biological integrity of the natural condition using reference water bodies.
- (a)(c) Standardized sampling and analytical methods used to characterize the biological integrity of these communities are provided in Appendix G of these rules. Characteristic measures of biological integrity include community level parameters such as: -species richness, diversity, relative abundance of tolerant and intolerant aquatic organisms, density, and the functional group composition.

(b) ~~In addition, the Secretary may determine whether there is full support of the aquatic habitat use through other appropriate methods of evaluation, including habitat assessments.~~

§ 29A-306 Use-specific Management Objectives and Criteria by Class

(a) Aquatic Biota and Wildlife.

(1) Class A(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain excellent biological integrity and aquatic biota and wildlife consistent with waters in their natural condition.

(B) Biological Criteria. Measures of biological integrity for aquatic macroinvertebrate and fish assemblages consistent with waters in their natural condition.

(C) Nutrient Criteria. The nutrient criteria are in Table 2.

(2) Class B(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain very good biological integrity.

(B) Biological Criteria. Change from the natural condition for aquatic macroinvertebrate and fish assemblages limited to minor changes in the relative proportions of taxonomic ~~and~~ functional, tolerant, and intolerant aquatic organisms components. ~~Relative proportions of tolerant and intolerant aquatic organisms consistent with waters in their natural condition.~~

(C) Nutrient Criteria. The nutrient criteria are in Table 2.

(3) Classes A(2) and B(2).

(A) Management Objectives. Waters shall be managed to achieve and maintain good biological integrity.

(B) Biological Criteria. Change from the natural condition for aquatic macroinvertebrate and fish assemblages not exceeding moderate changes in the relative proportions of taxonomic, functional, tolerant, and intolerant aquatic organisms.

(C) Nutrient Criteria. The nutrient criteria are in Table 2.

Table 2. Combined Nutrient Criteria for Aquatic Biota and Wildlife in Rivers and Streams<sup>1</sup>

	Class A(1)			Class B(1)			Classes A(2) and B(2)		
Stream Type <sup>2</sup>	Small, High-Gradient <u>SHG</u>	Medium, High-Gradient <u>MHG</u>	Warm-Water, Medium Gradient <u>WWMG</u>	Small, High-Gradient <u>SHG</u>	Medium, High-Gradient <u>MHG</u>	Warm-Water, Medium Gradient <u>WWMG</u>	Small, High-Gradient <u>SHG</u>	Medium, High-Gradient <u>MHG</u>	Warm-Water, Medium Gradient <u>WWMG</u>
Nutrient Concentrations									
Total Phosphorus (µg/L) <sup>3</sup>	10	9	18	10	9	21	12	15	27
Nutrient Response Conditions									
pH	Not to exceed 8.5 standard units.								
Turbidity	Consistent with the criteria in § 29A-302(4) of these rules.								
Dissolved Oxygen	Consistent with the criteria in § 29A-302(5) of these rules.								
Aquatic Biota	Consistent with the criteria under § 29A-305(a) of these rules.								
<p>1. Compliance with nutrient criteria shall be achieved either by compliance with the nutrient concentration values specified above or by compliance with all nutrient response conditions. In situations where the applicable nutrient concentrations are achieved but the nutrient response conditions are not met as a result of nutrient enrichment, the Secretary may establish alternate nutrient concentration values on a site-specific basis, as necessary, to achieve compliance with the nutrient response conditions. All waters shall maintain a level of water quality that provides for the attainment and maintenance of the water quality standards of downstream waters.</p> <p>2. Stream type determinations made by the Secretary are based on biological community types that relate to stream size, gradient, and elevation. <u>The stream types are Small High Gradient (SHG), Medium High Gradient (MHG), and Warm Water Moderate Gradient (WWMG).</u></p> <p>3. Not to be exceeded at low median monthly flow during June through October in a section of the stream representative of well-mixed flow.</p>									

(b) Aquatic Habitat.

(1) Class A(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain excellent quality aquatic habitat. The physical habitat structure, stream processes, and flow characteristics of rivers and streams and the physical ~~character~~ habitat and water level of lakes and ponds shall be managed consistent with waters in their natural condition.

(B) Criteria.

- (i) Rivers and Streams. No change in flow characteristics, physical habitat structure, and stream processes outside the range of the natural condition.
- (ii) Lakes, Ponds, and Reservoirs. No change in aquatic habitat measures outside the range of the natural condition.
- (iii) Hydrology Criteria. Waters shall comply with the Hydrology Criteria in § 29A-304 of these rules.

(2) Class B(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain very high quality aquatic habitat. The physical habitat structure, stream processes, and flow characteristics of rivers and streams and physical ~~character-habitat~~ and water level of lakes and ponds necessary to fully support all life-cycle functions of aquatic biota and wildlife, including overwintering and reproductive requirements, are maintained and protected.

(B) Criteria.

- (i) Rivers and Streams. Changes to flow characteristics, physical habitat structure, and stream processes limited to minor differences from the natural condition and consistent with the full support of very high quality aquatic habitat.
- (ii) Lakes, Ponds, and Reservoirs. Changes in aquatic habitat limited to minor differences from the natural condition and consistent with very high quality aquatic habitat.
- (iii) Hydrology Criteria. Waters shall comply with the Hydrology Criteria in § 29A-304 of these rules.

(3) Classes A(2) and B(2).

(A) Management Objectives. Waters shall be managed to achieve and maintain high quality aquatic habitat. The physical habitat structure, stream processes, and flow characteristics of rivers and streams and the physical ~~character-habitat~~ and water level of lakes and ponds necessary to fully support all life-cycle functions of aquatic biota and wildlife, including overwintering and reproductive requirements, are maintained and protected.

(B) Criteria.

- (i) Rivers and Streams. Changes to flow characteristics, physical habitat structure, and stream processes limited to moderate differences from the natural condition and consistent with the full support of high quality aquatic habitat.
- (ii) Lakes, Ponds, and Reservoirs. Changes in aquatic habitat limited to moderate differences from ~~the~~ natural condition and consistent with high quality aquatic habitat. When such habitat changes are a result of water level fluctuation, compliance may be determined on the basis of aquatic habitat studies.



(iii) Hydrology Criteria. Waters shall comply with the Hydrology Criteria in § 29A-304 of these rules.

(c) Aesthetics.

(1) Class A(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain excellent aesthetic quality.

(B) Criteria.

(i) Rivers and Streams. Water character, flows, water level, bed and channel characteristics, and flowing and falling waters in their natural condition.

(ii) Lakes, Ponds, and Reservoirs. Refer to Table 3.

(2) Classes A(2) and B(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain very good aesthetic quality.

(B) Criteria.

(i) Rivers and Streams. Water character, flows, water level, bed and channel characteristics, and flowing and falling waters of very good aesthetic value.

(ii) Lakes, Ponds, and Reservoirs. Refer to Table 3.

(3) Class B(2).

(A) Management Objectives. Waters shall be managed to achieve and maintain good aesthetic quality.

(B) Criteria.

(i) Rivers and Streams. Water character, flows, water level, bed and channel characteristics, and flowing and falling water of good aesthetic value.

(ii) Lakes, Ponds, and Reservoirs. Refer to Tables 1 and 3.

Table 3. Combined Nutrient Criteria for Aesthetics Uses in Lakes, Ponds, and Reservoirs Except for Lake Champlain and Lake Memphremagog<sup>1,2</sup>

	Class A(1)	Classes A(2) and B(1)	Class B(2)
Nutrient Concentrations			
Total Phosphorus <sup>3</sup> (µg/L)	12	17	18
Nutrient Response Conditions			
Secchi Disk Depth (meters) <sup>4</sup>	5.0	3.2	2.6
Chlorophyll-a (µg/L) <sup>3</sup>	2.6	3.8	7.0
pH	Not to exceed 8.5 standard units.		
Turbidity	Consistent with the criteria in § 29A-302(4) of these rules.		
Dissolved Oxygen	Consistent with the criteria in § 29A-302(5) of these rules.		
<p>1. Compliance with nutrient criteria shall be achieved either by compliance with the nutrient concentration values specified above or by compliance with all nutrient response conditions. In situations where the applicable nutrient concentrations are achieved but the nutrient response conditions are not met as a result of nutrient enrichment, the Secretary may establish alternate nutrient concentration values on a site-specific basis, as necessary, to achieve compliance with the nutrient response conditions. All waters shall maintain a level of water quality that provides for the attainment and maintenance of the water quality standards of downstream waters.</p> <p>2. Applies to lakes and reservoirs greater than 20 acres in surface area with a drainage area to surface area ratio less than 500:1, excluding Lake Champlain and Lake Memphremagog.</p> <p>3. June through September mean not to be exceeded in the photosynthetic depth (euphotic) zone at a central location in the lake.</p> <p>4. June through September mean not to be less at a central location in the lake.</p>			

(d) Recreation – Boating.

(1) Class A(1).

- (A) Management Objectives. Waters shall be managed to achieve and maintain excellent quality boating as compatible with the natural condition.
  - (B) Criteria. Boating to the full extent naturally feasible without degradation due to artificial flow and water level management or artificial physical impediments.
- (2) Class B(1).
- (A) Management Objectives. Waters shall be managed to achieve and maintain very good quality boating.
  - (B) Criteria. Boating to the extent feasible with no more than minor degradation due to artificial flow and water level management or artificial impediments, and with appropriate mitigation for artificial physical impediments.
- (3) Classes A(2) and B(2).
- (A) Management Objectives. Waters shall be managed to achieve and maintain a level of water quality compatible with good quality boating.
  - (B) Criteria. Waters shall comply with the Hydrology Criteria in § 29A-304 of these rules.
- (e) Recreation – Fishing.
- (1) Class A(1).
- (A) Management Objectives. Waters shall be managed to achieve and maintain excellent quality fishing consistent with the natural condition.
  - (B) Criteria.
    - (i) Measures of wild salmonid densities, biomass, and age composition consistent with those expected in waters in their natural condition.
    - (ii) Waters that are designated cold water fish habitat shall comply with the Temperature Criteria in §29A-302(B) of these rules.
- (2) Class B(1).
- (A) Management Objectives. Waters shall be managed to achieve and maintain very good quality fishing.
  - (B) Criteria.
    - (i) Measures of wild salmonid densities, biomass, and age composition indicative of very good population levels.
    - (ii) Waters that are designated cold water fish habitat shall comply with the Temperature Criteria in § 29A-302(B) of these rules.
- (3) Classes A(2) and B(2).
- (A) Management Objectives. Waters shall be managed to achieve and maintain a level of water quality compatible with good quality fishing.

(B) Criteria.

- (i) Measures of wild salmonid densities, biomass, and age composition indicative of good population levels.
- (ii) Waters that are designated cold water fish habitat shall comply with the Temperature Criteria in § 29A-302(B) of these rules.

(f) Recreation – Swimming and Other Primary Contact Recreation.

(1) Class A(1).

- (A) Management Objectives. Waters shall be managed to achieve and maintain a level of water quality compatible with excellent quality swimming and other primary contact recreation with negligible risk of illness or injury from conditions that are a result of human activities.
- (B) Criteria. *Escherichia coli* – Not to exceed a geometric mean of 126 organisms/100ml obtained over a representative period of 60 days, and no more than 10% of samples above 235 organisms/100ml. None attributable to the discharge of wastes.

(2) Class A(2).

- (A) Management Objectives. Waters shall be managed, as necessary, for consistency with use as a public water source. Where sustained direct contact with the water occurs, waters shall be managed to achieve and maintain a negligible risk of illness or injury from conditions that are a result of human activities.
- (B) ~~Criteria~~Criteria. Waters shall comply with the *Escherichia coli* Criteria in subdivision (1)(B) of this subsection.

(3) Class B(1).

- (A) Management Objectives. Where sustained direct contact with the water occurs, waters shall be managed to achieve and maintain a level of water quality compatible with very good quality swimming and other primary contact recreation with negligible risk of illness or injury from conditions that are a result of human activities.
- (B) Criteria. *Escherichia coli* – Not to exceed a geometric mean of 126 organisms/100ml obtained over a representative period of 60 days, and no more than 10% of samples above 235 organisms/100 ml.

(34) Class B(2).

- (A) Management Objectives. Where sustained direct contact with the water occurs, waters shall be managed to achieve and maintain a level of water quality compatible with good quality swimming and other primary contact recreation with ~~very little~~negligible risk of illness or injury from conditions that are a result of human activities.

(B) Criteria. *Escherichia coli* – Not to exceed a geometric mean of 126 organisms/100ml obtained over a representative period of 60 days, and no more than 10% of samples above 235 organisms/100 ml. In waters receiving combined sewer overflows, the representative period shall be 30 days. The Secretary may, by permit condition, waive compliance with this criterion during all or any portion of the period between October 31 and April 1, provided that a health hazard is not created. The Secretary shall provide written notice to the Vermont Department of Health prior to issuing a permit waiving compliance with this criterion.

(g) Public Water Sources.

(1) Class A(2).

(A) Management Objectives. Waters shall be managed to achieve and maintain a uniformly excellent character and a level of water quality highly suitable for use as a public water source with filtration and disinfection or other required treatment.

(B) Criteria. Waters shall comply with the *Escherichia coli* Criteria in subsection (f)(1)(B) of this section.

(2) Class B(2).

(A) Management Objectives. Waters shall be managed to achieve and maintain a level of quality that is suitable for use as a public water source with filtration and disinfection or other required treatment.

(B) Criteria. *Escherichia coli* – Not to exceed a geometric mean of 126 organisms/100ml obtained over a representative period of 60 days, and no more than 10% of samples above 235 organisms/100 ml. ~~Waters shall comply with the *Escherichia coli* Criteria in subsection (f)(2)(B) of this section.~~

(h) Irrigation of Crops and Other Agricultural Uses. Class B(2). Management Objectives. Waters shall be managed to achieve and maintain a level of quality that is suitable, without treatment, for irrigation of crops used for human consumption without cooking and suitable for other agricultural uses.

§ 29A-307 Classification of Waters

Pursuant to 10 V.S.A. § 1253, all waters are classified for one or more uses as Class A(1), A(2), B(1), or B(2). Appendix F of these rules lists the specific classifications for all waters.

§ 29A-308 Fish Habitat Designation

To provide for the protection and management of fisheries, waters are designated in Appendix A as being either a cold or a warm water fish habitat. Where appropriate, such designations may be seasonal.

## Appendix A. FISH HABITAT DESIGNATION

### § A-01 Warm Water Fish Habitat

All wetlands, except those designated as cold water fish habitat in § A-02 of this appendix, and the following waters are designated as warm water fish habitat for purposes of these rules.

- (1) Battenkill, Walloomsac, Hoosic (Basin 1)
  - (A) Lake Hancock (Sucker Pond), Stamford
  - (B) Thompsons Pond, Pownal
  
- (2) Poultney, Mettawee, Southern Lake Champlain (Basins 2 & 4)
  - (A) All waters west of Vermont Route 22A.
  - (B) Austin Pond, Hubbardton
  - (C) Beebe Pond, Hubbardton
  - (D) Billings Marsh Pond, West Haven
  - (E) Burr Pond, Sudbury
  - (F) Coggman Pond, West Haven
  - (G) East Creek Site I, Orwell
  - (H) Echo Lake (Keeler Pond), Hubbardton/Sudbury
  - (I) Half Moon Pond, Hubbardton
  - (J) Hinkum Pond, Sudbury
  - (K) Lake Champlain south of the Crown Point Bridge.
  - (L) Lake Champlain, between the Crown Point Bridge and the Ferrisburg-Charlotte town boundary, where depths are less than 25 feet at Low Lake Level (93 feet NGVD) – June 1, through September 30, only.
  - (M) Lake Hortonia, Hubbardton/Sudbury
  - (N) Inman Pond, Fair Haven
  - (O) Lily Pond, Poultney
  - (P) Little Pond, Wells
  - (Q) Love's Marsh, Castleton
  - (R) Mill Pond (Parson's Mill Pond), Benson

- (S) Northeast Developer's Pond, Wells
- (T) Old Marsh Pond, Fair Haven
- (U) Perch Pond, Benson
- (V) Pine Pond, Castleton
- (W) Poultney River from Carvers Falls in West Haven to its confluence with Lake Champlain
- (X) Sunrise Lake, Benson/Orwell

(3) Otter Creek, Little Otter Creek, Lewis Creek (Basin 3)

- (A) All waters lying west of Vermont Route 22A and south of the City of Vergennes.
- (B) Brilyea East Pond, Addison
- (C) Brilyea West Pond, Addison
- (D) Chipman Lake (Tinmouth Pond), Tinmouth
- (E) Danby Pond, Danby
- (F) Fern Lake, Leicester
- (G) Lemon Fair River
- (H) Mud Pond, Leicester
- (I) Otter Creek from the outfall of the Proctor wastewater treatment facility in Proctor, to its confluence with Lake Champlain, except that portion between the Beldens Dam and the Huntington Falls Dam in New Haven/Weybridge.
- (J) Richville Pond, Shoreham
- (K) Stone Bridge Pond, Panton/Addison
- (L) Wallingford Pond, Wallingford

(4) Northern Lake Champlain (Basin 5)

- (A) All streams, creeks, and brooks in Grand Isle County.
- (B) Lake Carmi, Franklin
- (C) Lake Champlain, between the Ferrisburgh-Charlotte town boundary and the Canadian boundary, where depths are less than 25 feet at Low Lake Level (93 feet NGVD) - June 1, through September 30, only.
- (D) Bartlett Brook, South Burlington
- (E) Cutler Pond, Highgate

- (F) Englesby Brook, Burlington
- (G) Holmes Creek, Charlotte,
- (H) Indian Brook, Colchester from Vermont Routes 2 & 7 to its confluence with Lake Champlain.
- (I) Jewett Brook, St. Albans Town
- (J) Kimball Brook, Ferrisburgh
- (K) Lake Iroquois, Hinesburg/Williston
- (L) LaPlatte River from its confluence with Patrick Brook in Hinesburg extending downstream to the Spear Street extension bridge in Charlotte annually from the period June 1, through September 30, only.
- (M) Long Pond, Milton
- (N) Lower Lake, (Lake Sunset), Hinesburg
- (O) Malletts Creek, Colchester, from Vermont Routes 2 & 7 to its confluence with Lake Champlain.
- (P) McCabes Brook, Shelburne
- (Q) Milton Pond, Milton
- (R) Mud Creek Pond, Alburg
- (S) Murr (Monroe) Brook, Shelburne
- (T) Pond Brook, Colchester
- (U) Potash Brook, South Burlington
- (V) Rock River from the Canadian boundary to its confluence with Lake Champlain.
- (W) Round Pond, Milton
- (X) Rugg Brook, Georgia
- (Y) St. Albans Reservoir (N), Fairfax
- (Z) Stevens Brook, St. Albans
- (AA) Trout Brook, Milton

(5) Missisquoi (Basin 6)

- (A) Metcalf Pond, Fletcher
- (B) Fairfield Pond, Fairfield
- (C) Fairfield Swamp Pond, Fairfield



- (D) Missisquoi River from the outfall of the Enosburg Falls wastewater treatment facility to the Swanton Dam Swanton.

(6) Lamoille (Basin 7)

- (A) Arrowhead Mountain Lake, Milton/Georgia
- (B) Flagg Pond, Wheelock
- (C) Halfmoon Pond, Fletcher
- (D) Hardwick Lake, Hardwick
- (E) Horse Pond, Greensboro
- (F) Lake Elmore, Elmore
- (G) Lamoille River from the Peterson Dam in Milton to its confluence with Lake Champlain - June 1, through September 30, only.
- (H) Long Pond (Belvidere Pond), Eden
- (I) Long Pond, Greensboro
- (J) Tuttle Pond, Hardwick
- (K) Wapanaki Lake, Wolcott

(7) Winooski (Basin 8)

- (A) Berlin Pond, Berlin
- (B) Bliss Pond, Calais
- (C) Coits Pond, Cabot
- (D) Cranberry Meadow Pond, Woodbury
- (E) Curtis Pond, Calais
- (F) Gillett Pond, Richmond
- (G) Harwood Pond, Elmore
- (H) Molly's Pond, Cabot
- (I) North Montpelier Pond, East Montpelier/Calais
- (J) Richmond Pond, Richmond
- (K) Shelburne Pond, Shelburne
- (L) Sodom Pond, East Montpelier/Calais
- (M) Valley Lake (Dog Pond), Woodbury
- (N) Winooski River from Green Mountain Power Corporation #19, in Essex/Williston to its confluence with Lake Champlain – June 1, through September 30, only.

(8) White River (Basin 9)

- (A) Lamson Pond, Brookfield
- (B) Silver Lake, Barnard

(9) Ottauquechee, Black (Basins 10 & 13)

- (A) Black River from the Lovejoy Dam in Springfield to its confluence with the Connecticut River - June 1, through September 30, only.
- (B) Deweys Mill Pond, Hartford
- (C) Lake Ninevah, Mount Holly
- (D) Lake Pinneo, Hartford
- (E) Lake Runnemedede (Evert's Pond), Windsor
- (F) North Hartland Reservoir, Hartland/Hartford
- (G) North Springfield Reservoir, Springfield/Weathersfield
- (H) Ottauquechee River from the North Hartland Dam in Hartland to its confluence with the Connecticut River.

(10) West, Williams, Saxtons (Basins 11 & 13)

- (A) Burbee Pond, Windham
- (B) Cole Pond, Jamaica
- (C) Lily Pond, Londonderry
- (D) Lowell Lake, Londonderry
- (E) Mindard's Pond, Rockingham

(11) Deerfield (Basins 12 & 13)

- (A) Gates Pond, Whitingham
- (B) Grout Pond, Stratton
- (C) Howe Pond, Readsboro
- (D) Jacksonville Pond, Whitingham
- (E) Lily Pond, Vernon
- (F) North Pond, Whitingham
- (G) Sadawaga Pond, Whitingham

- (H) Shippee Pond, Whitingham
- (12) Stevens, Wells, Waits, Ompompanoosuc (Basins 14 & 16)
  - (A) Halls Lake, Newbury
  - (B) Harriman Pond, Newbury
  - (C) Lake Abenaki, Thetford
  - (D) Lake Morey, Fairlee
  - (E) Lower Symes Pond, Ryegate
  - (F) Ticklenaked Pond, Ryegate
  - (G) Waits River from the CVPS Dam in Bradford to its confluence with the Connecticut River - June 1, to September 30.
- (13) Passumpsic (Basin 15)
  - (A) Bruce Pond, Sheffield
  - (B) Chandler Pond, Wheelock
  - (C) Keiser Pond, Peacham/Danville
- (14) Upper Connecticut, Nulhegan, Willard Stream, Paul Stream (Basin 16)
  - (A) Dennis Pond, Brunswick
  - (B) Stevens Pond, Maidstone
- (15) Lake Memphremagog, Black, Barton, Clyde, Coaticook (Basin 17)
  - (A) Daniels Pond, Glover
  - (B) Lake Derby, Derby
  - (C) Long Pond, Sheffield
  - (D) Little Hosmer Pond, Craftsbury
  - (E) Mud Pond, Craftsbury
  - (F) Mud Pond, (North) Morgan
  - (G) Tildy's Pond (Clark Pond), Glover
  - (H) Toad Pond, Charleston
  - (I) Turtle Pond, Holland

§ A-02 Cold Water Fish Habitat

- (a) All waters not designated as warm water fish habitat under § A-01 of this appendix are hereby designated as cold water fish habitat for purposes of these rules.
- (b) The following wetlands are designated as cold water fish habitat:
  - (1) Those wetlands adjacent to the Dog River and its tributaries from the headwaters of the Dog River to the point where it first crosses State Aid Hhighway #62 in Roxbury, ~~a distance of~~ approximately 1.5 miles.
  - (2) Those wetlands adjacent to the headwaters of the Winhall River and its tributaries on the east and west side from the outlet of Stratton Pond to the Stratton-Winhall boundary, ~~a distance of~~ approximately 2.0 miles.
  - (~~€~~3) Those wetlands adjacent to the Batten Kill River from a point .75 miles north of East Dorset and extending to its confluence with Dufresne Pond in Manchester, ~~a distance of~~ approximately 5.5 miles.
  - (~~Ⓓ~~4) Those wetlands adjacent to the New Haven River and its tributaries from its confluence with Blue Bank Brook in Lincoln upstream to the headwaters of the respective tributaries, ~~a distance of~~ approximately 1.75 miles.

Appendix B. DESCRIPTION OF LAKE CHAMPLAIN AND LAKE MEMPHREMAGOG  
SEGMENTS FOR APPLICATION OF PHOSPHORUS CRITERIA

Segment	Description
Lake Champlain	
Missisquoi Bay	Area north of East Alburgh (Route 78) bridge and south of the international border.
Isle La Motte	Area within Vermont waters west of Grand Isle and North Hero Islands, and north of a line from Cumberland Head, NY to Wilcox Point on Grand Isle.
St. Albans Bay	Area northeast of a line from Hathaway Point to Lime Rock Point.
Northeast Arm	Area within Vermont waters east of Grand Isle and North Hero Islands, and north of the Sandbar Bridge, excluding St. Albans Bay, and including the large bays on Grand Isle and North Hero.
Malletts Bay	Area south of Sandbar Bridge and east of the causeway from Colchester Point to Grand Isle.
Main Lake	Area within Vermont waters south of a line from Cumberland Head, NY to Wilcox Point on Grand Isle, and north of a line from Split Rock Point, NY to Thompsons Point, VT, excluding Malletts Bay, Burlington Bay and Shelburne Bay.
Burlington Bay	Area east of a line from Lone Rock Point to Oakledge.

Shelburne Bay	Area south of a line from Shelburne Point to Red Rock Point.
Otter Creek	Area within Vermont waters south of a line from Split Rock Point, NY to Thompsons Point, VT, and north of a line from Rock Harbor, NY to Basin Harbor, VT.
Port Henry	Area within Vermont waters south of a line from Rock Harbor, NY to Basin Harbor, VT, and north of Crown Point Bridge.
South Lake A	Area within Vermont waters south of Crown Point Bridge and north Benson Landing.
South Lake B	Area within Vermont waters south of Benson Landing.
Lake Memphremagog	
Main Lake	Area within Vermont waters north of the Route 5 Bridge.
South Bay	Area south of the Route 5 bridge and north of the mouth of the Barton River.

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
<i>Toxic Metals</i>							
Aluminum pH 5.0 – 10.5	EPA 7429905	7429905	TT	---	---	See Appendix K of EPA December 2018 water quality criteria document for Aluminum, which provides lookup tables for various water chemistry conditions. The Aluminum Criteria Calculator V2.0 can also be used to determine criteria. <sup>f</sup>  Application of this criteria is described in the Implementation Procedure for Aluminum. <sup>g</sup>	
Antimony	65FR66443	7440360	TT	5.6	640	---	---
Arsenic	65FR31682	7440382	A	0.02 <sup>h</sup>	1.5 <sup>h</sup>	340	150
Cadmium <sup>d,e</sup>	81FR19176 EPA 820-R-16-002	7440439	TT	---	---	0.94	0.43
Chromium (VI) <sup>d</sup>	65FR31682	18540299	TT	---	---	16	11
Chromium (III) <sup>d,e</sup>	EPA820/B-96-001	16065831	TT	---	---	322	42
Copper <sup>d,e,o</sup>	65FR31682	7440508	TT	---	---	7.0	4.95
Cyanide	80FR36986-02 EPA 820-R-15-031	57125	TT	4	400	22 <sup>n</sup>	5.2 <sup>n</sup>

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Iron <sup>c</sup>	EPA 440/5-86-001	7439896	TT	300	---	---	1,000
Lead <sup>d,e</sup>	65FR31682	7439921	TT	---	---	30.1	1.17
Mercury	62FR42160 EPA 440/5-86-001	7439976	TT/BC	---	---	1.4 <sup>d,f</sup>	0.012 (1986)
Methylmercury	EPA823-R-01-001	22967926	---	---	0.3 mg/kg <sup>l</sup>	---	---
Nickel <sup>d,e</sup>	65FR31682	7440020	TT	610	4,600	260	29
Selenium	62FR42160 65FR31682 65FR66443	7782492	TT	170	4200	See EPA June 2016 water criteria document for Selenium (Table 1) <sup>+p,q</sup> 5	
Silver <sup>d,e</sup>	65FR31682	7440224	TT	---	---	1.02	---
Thallium	68FR75510	7440280	TT	0.24	0.47	---	---
Zinc <sup>d,e</sup>	65FR31682	7440666	TT	---	---	65	65
<i>Volatile Organic Compounds</i>							
Acrolein	80FR36986-02 EPA 820-R-15-003	107028	TT	3	400	3	3



Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Acrylonitrile	80FR36986-02 EPA 820-R-15-004	107131	C	0.061	7.0	---	---
Benzene	80FR36986-02 EPA 820-R-15-009	71432	A	2.1	58	---	---
Bromoform	80FR36986-02 EPA 820-R-15-021	75252	C	7.0	120	---	---
Carbon Tetrachloride	80FR36986-02 EPA 820-R-15-023	56235	C	0.4	5	---	---
Chlorodibromomethane	80FR36986-02 EPA 820-R-15-026	124481	C	0.80	21	---	---
Chloroform	80FR36986-02 EPA 820-R-15-027	67663	C	60	2,000	---	---
Dichlorobromomethane	80FR36986-02 EPA 820-R-15-033	75274	C	0.95	27	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
1,2-Dichloroethane	80FR36986-02 EPA 820-R-15-075	107062	C	9.9	650	---	---
1,1-Dichloroethylene	80FR36986-02 EPA 820-R-15-071	75354	C	300	20,000 <del>3,000</del>	---	---
1,2-Dichloropropane	80FR36986-02 EPA 820-R-15-076	78875	---	0.90	31	---	---
1,3-Dichloropropylene	80FR36986-02 EPA 820-R-15-080	542756	TT	0.27	12	---	---
Ethylbenzene	80FR36986-02 EPA 820-R-15-042	100414	TT	68	130	---	---
Methyl Bromide	80FR36986-02 EPA 820-R-15-056	74839	TT	100	10,000	---	---
Methylene Chloride	80FR36986-02 EPA 820-R-15-057	75092	C	20	1,000	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Monochlorobenzene	80FR36986-02 EPA 820-R-15-025	108907	TT	100	800	---	---
1,1,2,2-Tetrachloroethane	80FR36986-02 EPA 820-R-15-069	79345	C/BC	0.2	3	---	---
Tetrachloroethylene	80FR36986-02 EPA 820-R-15-063	127184	C	10	29	---	---
Toluene	80FR36986-02 EPA 820-R-15-064	108883	TT	57	520	---	---
1,2-Trans-Dichloroethylene (DCE)	80FR36986-02 EPA 820-R-15-078	156605	---	100	4,000	---	---
1,1,1-Trichloroethane	80FR36986-02 EPA 820-R-15-068	71556	---	10,000	200,000	---	---
1,1,2-Trichloroethane	80FR36986-02 EPA 820-R-15-070	79005	C	0.55	8.9	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Trichloroethylene (TCE)	80FR36986-02 EPA 820-R-15-070	79016	C	0.6	7	---	---
<i>Acid Organic Compounds</i>							
Vinyl Chloride	<u>80FR36986-02</u> <u>EPA 820-R-15-067</u>	75014	C	0.022	1.6	---	---
2-Chlorophenol	80FR36986-02 EPA 820-R-15-089	95578	---	30	800	---	---
2,4-Dichlorophenol	80FR36986-02 EPA 820-R-15-084	120832	TT	10	60	---	---
2,4-Dimethylphenol	80FR36986-02 EPA 820-R-15-085	105679	---	100	3,000	---	---
Dinitrophenols	80FR36986-02 EPA 820-R-15-038	25550587	TT	10	1,000	---	---
2,4 Dinitrophenol	80FR36986-02 EPA 820-R-15-086	51285	TT	10	300	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
2-Methyl-4,6-Dinitrophenol	80FR36986-02 EPA 820-R-15-090	534521	TT	2	30	---	---
Pentachlorobenzene	80FR36986-02	608935	BC	0.1	0.1	---	---
Pentachlorophenol	80FR36986-02 EPA 820-R-15-060	87865	C/BC	0.03	0.04	19 <sup>k</sup>	15 <sup>k</sup>
Phenol	80FR36986-02 EPA 820-R-15-061	108952	TT	4,000	300,000	---	---
Nonylphenol	EPA-822-F05-003	84852153	C/BC	---	---	28	6.6
2,4,6-Trichlorophenol	80FR36986-02 EPA 820-R-15-083	88062	C/BC	1.5	2.8	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
<i>Base Neutral Compounds</i>							
Acenaphthene	80FR36986-02 EPA 820-R-15-002	83329	---	70	90	---	---
Anthracene	80FR36986-02 EPA 820-R-15-008	120127	TT/BC	300	400	---	---
Benzidine	80FR36986-02 EPA 820-R-15-010	92875	A	0.00014	0.011	---	---
Benzo(a)Anthracene	80FR36986-02 EPA 820-R-15-011	56553	C/BC	0.0012	0.0013	---	---
Benzo(a)Pyrene	80FR36986-02 EPA 820-R-15-012	50328	C/BC	0.00012	0.00013	---	---
Benzo(b)Fluoranthene	80FR36986-02 EPA 820-R-15-013	205992	C/BC	0.0012	0.0013	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Benzo(k)Fluoranthene	80FR36986-02 EPA 820-R-15-014	207089	C/CB	0.012	0.013	---	---
Bis(Chloromethyl) Ether (BCME)	80FR36986-02 EPA 820-R-15-017	542881	C	0.00015	0.017	---	---
Bis(2-Ethylhexyl)Phthalate	80FR36986-02 EPA 820-R-15-020	117817	C/BC	0.32	0.37	---	---
Butylbenzyl Phthalate <sup>w</sup>	80FR36986-02 EPA 820-R-15-022	85687	C/BC	0.10	0.10	---	---
Chloroethyl ether (Bis-2)	80FR36986-02 EPA 820-R-15-018	111444	C	0.030	2.2	---	---
Chloroisopropyl ether(Bis-2)	80FR36986-02 EPA 820-R-15-019	108601	TT	200	4,000	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
2-Chloronaphthalene	80FR36986-02 EPA 820-R-15-088	91587	---	800	1,000	---	---
Chrysene	80FR36986-02 EPA 820-R-15-030	218019	C/BC	0.12	0.13	---	---
Dibenzo(a,h)Anthracene	80FR36986-02 EPA 820-R-15-032	53703	C/BC	0.00012	0.00013	---	---
1,2-Dichlorobenzene	80FR36986-02 EPA 820-R-15-074	95501	TT/BC	1,000	3,000	---	---
1,3-Dichlorobenzene	80FR36986-02 EPA 820-R-15-079	541731	TT/BC	7	10	---	---
1,4-Dichlorobenzene	80FR36986-02 EPA 820-R-15-081	106467	TT/BC	300	900	---	---
3,3'-Dichlorobenzidine	80FR36986-02 EPA 820-R-15-091	91941	C/BC	0.049	0.15	---	---



Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Diethyl Phthalate	80FR36986-02 EPA 820-R-15-035	84662	TT	600	600	---	---
Dimethyl Phthalate	80FR36986-02 EPA 820-R-15-036	131113	TT	2,000	2,000	---	---
Di-n-butyl Phthalate	80FR36986-02 EPA 820-R-15-037	84742	TT/BC	20	30	---	---
2,4-Dinitrotoluene	80FR36986-02 EPA 820-R-15-087	121142	C	0.049	1.7	---	---
1,2-Diphenylhydrazine	80FR36986-02 EPA 820-R-15-077	122667	C	0.03	0.2 <sup>h</sup>	---	---
Fluoranthene	80FR36986-02 EPA 820-R-15-043	206440	TT/BC	20	20	---	---
Fluorene	80FR36986-02 EPA 820-R-15-044	86737	TT/BC	50	70	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Hexachlorobenzene	80FR36986-02 EPA 820-R-15-048	118741	C/BC	0.000079	0.000079	---	---
Hexachlorobutadiene	80FR36986-02 EPA 820-R-15-049	87683	C/BC	0.01	0.01	---	---
Hexachlorocyclohexane (HCH) -Technical	80FR36986-02 EPA 820-R-15-050	608731	C	0.0066	0.010	---	---
Hexachlorocyclopentadiene	80FR36986-02 EPA 820-R-15-051	77474	TT/BC	4	4	---	---
Hexachloroethane	80FR36986-02 EPA 820-R-15-052	67721	C/BC	0.1	0.1	---	---
Indeno(1,2,3-cd) Pyrene	80FR36986-02 EPA 820-R-15-053	193395	C/BC	0.0012	0.0013	---	---
Isophorone	80FR36986-02 EPA 820-R-15-054	78591	TT	34	1,800	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
3-Methyl-4-Chlorophenol	80FR36986-02 EPA 820-R-15-092	59507	---	500	2,000	---	---
Nitrobenzene	80FR36986-02 EPA 820-R-15-058	98953	TT	10	600	---	---
N-Nitrosodimethylamine	65FR66443	62759	C	0.00069 <sup>h</sup>	3.0 <sup>h</sup>	---	---
N-Nitrosodi-n-Propylamine	65FR66443	621647	---	0.0050 <sup>h</sup>	0.51 <sup>h</sup>	---	---
N-Nitrosodiphenylamine	65FR66443	86306	C	3.3 <sup>h</sup>	6.0 <sup>h</sup>	---	---
Pyrene	80FR36986-02 EPA 820-R-15-062	129000	TT/BC	20	30	---	---
1,2,4,5-Tetrachlorobenzene	80FR36986-02 EPA 820-R-15-073	95943	TT	0.03	0.03	---	---
1,2,4-Trichlorobenzene	80FR36986-02 EPA 820-R-15-072	120821	---	0.071	0.076	---	---
2,4,5-Trichlorophenol	80FR36986-02 EPA 820-R-15-082	95954	---	300	600	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
<i>Pesticides/PCBs</i>							
Aldrin	80FR36986-02 EPA 820-R-15-005	309002	C/BC	0.00000077	0.00000077	3.0 <sup>b</sup>	---
Carbaryl	EPA-820-R-12-007	63252	TT	---	---	2.1	2.1
Chlordane	80FR36986-02 EPA 820-R-15-024	57749	C/BC	0.00031	0.00032	2.4 <sup>b</sup>	.004 <sup>b</sup>
Chlorophenoxy Herbicide (2,4-D)	80FR36986-02 EPA 820-R-15-028	94757	C	1,300	12,000	---	---
Chlorophenoxy Herbicide (2,4,5-TP) [Silvex]	80FR36986-02 EPA 820-R-15-029	93-72-1	C	100	400	---	---
Chlorpyrifos <sup>c</sup>	EPA 440/5-86-001	2921882	---	---	---	0.083	0.041
4,4'-DDT	80FR36986-02 EPA 820-R-15-095	50293	C/BC	0.000030	0.000030	1.1 <sup>b</sup>	0.001 <sup>b</sup>

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
4,4'-DDE	80FR36986-02 EPA 820-R-15-094	72559	C/BC	0.000018	0.000018	---	---
4,4'-DDD	80FR36986-02 EPA 820-R-15-093	72548	C/BC	0.00012	0.00012	---	---
Demeton <sup>b</sup>	EPA 440/5-86-001	8065483	---	---	---	---	0.1
Diazinon	EPA-822-R-05-006	333415	TT	---	---	0.17	0.17
Dieldrin	80FR36986-02 EPA 820-R-15-034	60571	C	0.0000012	0.0000012	0.24	0.056

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
alpha-Endosulfan	80FR36986-02 EPA 820-R-15-007	959988	TT	20	30	0.22 <sup>b</sup>	0.056 <sup>b</sup>
beta-Endosulfan	80FR36986-02 EPA 820-R-15-016	33213659	TT	20	40	0.22 <sup>b</sup>	0.056 <sup>b</sup>
Endosulfan Sulfate	80FR36986-02 EPA 820-R-15-039	1031078	TT	20	40	---	---
Endrin	80FR36986-02 EPA 820-R-15-040	72208	TT	0.03	0.03	0.086	0.036
Endrin Aldehyde	80FR36986-02 EPA 820-R-15-041	7421934	TT	1	1	---	---
Guthion	EPA 440/5-86-001	86500	=				0.01

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Heptachlor	80FR36986-02 EPA 820-R-15-046	76448	C	0.0000059	0.0000059	0.52 <sup>b</sup>	0.0038 <sup>b</sup>
Heptachlor Epoxide	80FR36986-02 EPA 820-R-15-047	1024573	C	0.000032	0.000032	0.52 <sup>b</sup>	0.0038 <sup>b</sup>
Benzene hexachloride-alpha	80FR36986-02 EPA 820-R-15-006	319846	C/BC	0.00036	0.00039	---	---
Benzene hexachloride-beta	80FR36986-02 EPA 820-R-15-015	319857	C/BC	0.0080	0.014	---	---
Benzene hexachloride-gamma (Lindane)	EPA 820-R-15-045	58899	TT/BC	4.2	4.4	0.95	---
Malathion <sup>c</sup>	EPA 440/5-86-001	121755	---	---	---	---	0.1
Methoxychlor	80FR36986-02 EPA 820-R-15-055	72435	TT	0.02	0.02	---	<u>0.03</u>
Mirex	EPA 440/5-86-001	2385855	---	---	---	---	<u>0.001</u>

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Parathion <sup>c</sup>	EPA 440/5-86-001	56382	---	---	---	0.065	0.013
Total PCB's <sup>m</sup>	65FR31682	53469219	C/BC	0.000064 <sup>h</sup>	0.000064 <sup>h</sup>	---	0.014 <sup>b</sup>
	65FR66443						
Dioxin (2,3,7,8-TCDD)	65FR66443	1746016	C/BC	5.0x10 <sup>-9</sup>	5.1x10 <sup>-9</sup>	---	---
Toxaphene	80FR36986-02	8001352	C/BC	0.00070	0.00071	0.73	0.0002
	EPA 820-R-15-065						
Tributyltin (TBT)	<u>EPA 822-R-03-031</u>		---			<u>0.46</u>	<u>0.072</u>
<i>Other Substances</i>							
Ammonia <sup>e</sup>	EPA 822-R-13-001	7664417	---	---	---	See EPA April 2013 water quality criteria document for Ammonia. Tables 5a and 5b provide the acute criteria values and Table 6 provides the chronic criteria. <sup>a,b</sup>	
Asbestos	57FR60848	1332214	A	7 million fibers/L	---	---	---
Barium <sup>c</sup>	EPA 440/5-86-001	7440393	---	1,000	---	---	---



**Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA**

**Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.**

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria <sup>a</sup>	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Chlorine <sup>c</sup>	EPA 440/5-86-001	7782505	---	---	---	19	11
Chloride <sup>c</sup>	53FR19028	16887006	---	---	---	860,000	230,000

**GENERAL NOTES:**

This Appendix has been updated to reflect USEPA recommendations as of ~~March 2016~~ August 2021.

~~The most significant changes from previous versions of this appendix are to Human Health criteria and reflect EPA's 2015 update to Human Health Ambient Water Quality Criteria (EPA 820-F-15-001, June 2015) as published in 80FR36986-02. Additional notes and information concerning these criteria can be found in the documents referenced here.~~

Tox Class - designated toxicity class for substance: A=Class A carcinogen (known human carcinogen); C=Carcinogenic (probable or possible human carcinogen); TT=Threshold Toxicant (not a known or probable carcinogen); BC=High potential to bioconcentrate or bioaccumulate;

Carcinogenic - for those toxic substances that are identified as carcinogens (A or C) the criteria have been established at a risk level of 10<sup>-6</sup> assuming a lifetime exposure to a 80 Kg male consuming 22 grams per day of fish and shell-fish products and ingesting 2.4 liters of water per day.

Threshold Toxicants - for those toxic substances that are identified as non-carcinogens (TT) the criteria are best estimates of concentrations that are not expected to produce adverse effects in human health assuming a lifetime exposure to a 80 Kg male consuming 22 grams per day of fish and shell-fish products and ingesting 2.4 liters of water per day.

**Footnotes:**

- a. Maximum Allowable Concentration (MAC) = the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (1-hour average) once every three years without deleterious effects. Average Allowable Concentration (AAC) - the highest concentration of a pollutant to which aquatic life can be exposed for an

extended period of time (4 days) once every three years without deleterious effects.  $\mu\text{g/l}$  = micrograms per liter. The MAC is the equivalent to the Federal Criteria Maximum Concentration (CMC) and the AAC is equivalent to the Federal Criteria Continuous Concentration (CCC).

- b. The aquatic life criteria for this compound were developed in 1980 using 1980 EPA guidelines for criteria development. The MAC (CMC) or acute value shown is a final acute value (FAV) that by the 1980 guidelines is an instantaneous value.
- c. ~~The EPA 2013 Aquatic Life Ambient Criteria for Ammonia document is posted at <https://dec.vermont.gov/sites/dec/files/documents/epa-2013-aquatic-life-criteria-ammonia.pdf>. Compound is not listed in EPA's Section 304(a) Criteria for Priority Toxic Pollutants as published in the December 22, 1992, pages 60911-60917, of the Federal Register but is included in this appendix of the Vermont Water Quality Standards because the pollutant can be deleterious to aquatic life and criteria have been developed for the protection of aquatic organisms.~~
- d. Criteria for this metal are expressed in terms of dissolved metal in the water column. Dissolved metal concentrations in the water column can be determined analytically or can be estimated from total metal concentrations using the conversion factors in Appendix D.
- e. Aquatic life criteria for this metal is expressed as a function of total hardness ( $\text{mg/l}$  as  $\text{CaCO}_3$ ) in the water column and as a function of the pollutant's water effect ratio, WER, as defined in § 131.36(c). Unless otherwise determined by the Secretary, in a manner consistent with the most current USEPA guidance, the WER shall be 1.0. The specific value given here corresponds to a hardness of 50  $\text{mg/l}$ . Criteria values for other hardness may be calculated from the equations shown in Appendix E.
- f. This criterion was derived from data for inorganic mercury (II) but is applied here to total mercury.
- g. Vermont promulgated numerical criteria for arsenic based on freshwater fish species bioconcentration factors (BCF). A BCF of 4 was used to calculate human health protection criteria.
- h. This criterion has been revised to reflect The Environmental Protection Agency's  $q1^*$  or RfD, as contained in the Integrated Risk Information System (IRIS) as of May 17, 2002. The fish tissue bioconcentration factor (BCF) from the 1980 Ambient Water Quality Criteria document was retained in each case.
- i. ~~The  $\text{MAC} = 1/[(f1/\text{MAC1}) + (f2/\text{MAC2})]$  where  $f1$  and  $f2$  are the fractions of total selenium that are treated as selenite and selenate, respectively, and  $\text{MAC1}$  and  $\text{MAC2}$  are 185.9  $\text{g/l}$  and 12.82  $\text{g/l}$ , respectively. This value for selenium is expressed in terms of total recoverable metal in the water column. It can be expressed in terms of dissolved metal by using the conversion factor (0.996 - MAC or 0.922 - AAC). No longer applicable.~~
- j. This human health criterion is the same as originally published in the Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value is now published in the Gold Book.

- k. Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows:  $MAC = \exp(1.005(\text{pH}) - 4.869)$ ;  $AAC = \exp(1.005(\text{pH}) - 5.134)$ . Values displayed in table correspond to a pH of 7.8.
- l. This fish tissue residue criterion for methylmercury is used for the purpose of determination of attainment pursuant to these Standards. Fish consumption advisory guidance for mercury in fish taken from the waters of Vermont is developed by the Vermont Department of Health and is available on their website.
- m. These criteria apply to total PCB's (e.g. the sum of all congener or all isomer or homolog or Arochlor analyses).
- n. These criteria expressed as ug free cyanide (as CN)/l.
- o. When site specific data are available, the Biotic Ligand Model (BLM) procedures identified in EPA's Aquatic Life Ambient Freshwater Quality Criteria – Copper (2007), EPA-822-R-07-001 will be used instead of the hardness-based criteria.- The Implementation Procedure for Copper which describes data requirements is posted at <https://dec.vermont.gov/sites/dec/files/documents/vermont-implementation-procedure-copper.pdf>.
- p. For chronic criteria that utilize 30-day average duration, 30Q10 flows shall apply.
- q. The EPA 2021 Revision to the 2016 Aquatic Life Ambient Water Quality Criterion for Selenium document is posted at <https://dec.vermont.gov/sites/dec/files/documents/epa-2021-revision-2016-aquatic-life-criteria-selenium.pdf>.
- r. The EPA 2018 Aquatic Life Ambient Water Quality Criteria for Aluminum document is posted at <https://dec.vermont.gov/sites/dec/files/documents/epa-2018-aquatic-life-criteria-aluminum.pdf> and the Aluminum Criteria Calculator can be downloaded at <https://www.epa.gov/wqc/aquatic-life-criteria-aluminum>.
- s. The Implementation Procedure for Aluminum is posted at <https://dec.vermont.gov/sites/dec/files/documents/vermont-implementation-procedure-aluminum.pdf>.

**Appendix D. CONVERSION FACTORS FOR ESTIMATING DISSOLVED METALS FROM TOTAL VALUES**

To convert total metal values to dissolved metal, multiply total metal values/concentrations by the conversion factor listed (or calculated) in the table below. Alternative methods for translating total to dissolved values following USEPA guidance (“The Metals Translator: Guidance for Calculating a Total Recoverable Metals Permit Limit from a Dissolved Criterion”; EPA 823-B-96-007) may be considered on a case-by-case basis.

<b>Metal</b>	<b>Conversion Factor for MAC</b>	<b>Conversion Factor for AAC</b>
<b>Arsenic</b>	1.0	1.0
<b>Cadmium</b>	$1.136672 - [(\ln \text{ hardness})(0.041838)]$	$1.101672 - [(\ln \text{ hardness})(0.041838)]$
<b>Chromium III</b>	0.316	0.860
<b>Chromium VI</b>	0.982	0.962
<b>Copper</b>	0.96	0.96
<b>Lead</b>	$1.46203 - [(\ln \text{ hardness})(0.145712)]$	$1.46203 - [(\ln \text{ hardness})(0.145712)]$
<b>Mercury</b>	0.85	0.85
<b>Nickel</b>	0.998	0.997
<b>Selenium</b>	---	---
<b>Silver</b>	0.85	---
<b>Zinc</b>	0.978	0.986

Appendix E. PARAMETERS FOR CALCULATING FRESHWATER TOTAL METALS CRITERIA THAT ARE HARDNESS DEPENDENT

MAC and AAC values are calculated using the equations below the table and inserting the metal-specific values shown in the table.

<b>Metal</b>	<b>m<sub>A</sub></b>	<b>b<sub>A</sub></b>	<b>m<sub>C</sub></b>	<b>b<sub>C</sub></b>
<b>Cadmium</b>	0.9789	-3.866	0.7977	-3.909
<b>Chromium III</b>	0.8190	3.7256	0.8190	0.6848
<b>Copper</b>	0.9422	-1.700	0.8545	-1.702
<b>Lead</b>	1.273	-1.460	1.273	-4.705
<b>Nickel</b>	0.8460	2.255	0.8460	0.0584
<b>Silver</b>	1.72	-6.59	---	---
<b>Zinc</b>	0.8473	0.884	0.8473	0.884

Hardness-dependent metals criteria can be calculated from the following equations:

$$\text{MAC (dissolved)} = \exp\{m_A [\ln (\text{hardness})] + b_A\} \text{ (Conversion Factor from Appendix D)}$$

$$\text{AAC (dissolved)} = \exp\{m_C [\ln (\text{hardness})] + b_C\} \text{ (Conversion Factor from Appendix D)}$$

## Appendix F. WATER QUALITY CLASSIFICATIONS

- (a) The classification of all waters has been established by a combination of legislative acts and by classification or reclassification decisions issued by the Water Resources Board or Secretary pursuant to 10 V.S.A. § 1253. Those waters reclassified by the Secretary to Class A(1), A(2), or B(1) for any use shall include all waters within the entire watershed of the reclassified waters unless expressly provided otherwise in the rule.
- (b) All waters above 2,500 feet altitude, National Geodetic Vertical Datum, are designated Class A(1) for all uses, unless specifically designated Class A(2) for use as a public water source.
- (c) All waters at or below 2,500 feet altitude, National Geodetic Vertical Datum, are designated Class B(2) for all uses, unless specifically designated as Class A(1), A(2), or B(1) for any use.
- (d) The waters listed in the following table are those waters classified as A(1), A(2), or B(1) for one or more designated uses.

Appendix F. WATER QUALITY CLASSIFICATIONS Waters	Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Battenkill, Walloomsac, Hoosic (Basin 1)</b>										
<b>Battenkill</b>										
<p><b>Unnamed tributary to Bromley Brook.</b> Abandoned — Village of Manchester water source. The first unnamed tributary to Bromley Brook and all waters within its watershed upstream of the Manchester Water Company intake. The tributary is the first tributary on the right upstream of Bromley Brook's confluence with Bourn Brook. The intake is approximately 0.5 mile upstream of its juncture with Bromley Brook.</p>	A2	A2	A2	A2	A2	A2	A2	B2	6/30/64	0.5 mile
<p><b>*Surface waters of the Glastenbury Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally-designated Glastenbury Wilderness Area of the Green Mountain National Forest.</p>	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 4
<p><b>*Surface waters of the Lye Brook Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally-designated Lye Brook Wilderness Area of the Green Mountain National Forest.</p>	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 4
<b>Walloomsac River</b>										
<p><b>Basin Brook and Furnace Brook.</b> Basin Brook — Permanent; Furnace Brook — Abandoned — Village of North Bennington (WSID 5017) water sources. Basin Brook and all waters within its watershed to and including the North Bennington Reservoir in the Towns of Glastenbury and Shaftsbury.</p>	A2	A2	A2	A2	A2	A2	A2	B2	12/23/52	5.0 miles

Appendix F. WATER QUALITY CLASSIFICATIONS Waters	Aq. Biota	Aq.	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Bolles Brook.</b> Permanent — Village of Bennington (WSID 5016) water source. That portion of Bolles Brook and all waters within its watershed in the Towns of Glastenbury and Woodford upstream of the Bennington water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	5.3 miles
<b>Sucker Pond (Lake Hancock) and tributaries.</b> Emergency — Village of Bennington (WSID 5016) water source. Lake surface and all waters within its watershed in Stamford.	A2	A2	A2	A2	A2	A2	A2	B2	12/23/52	70 acres
<b>Barney Brook.</b> Abandoned — Village of Bennington water source. That portion of Barney Brook and all waters within its watershed in the Town of Woodford upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.3 miles
<b>Unnamed tributary to South Stream.</b> Abandoned — Village of Bennington water source. That portion tributary to South Stream and all waters within its watershed in the Town of Woodford upstream of the water intake in Bennington.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.0 mile
<b>Hoosic River</b>										
<b>Roaring Branch.</b> Abandoned — Town of Bennington water source. That portion of Roaring Branch and all waters within its watershed in the Town of Stamford upstream of the water intake in Pownal.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	2.3 miles
<b>Unnamed tributaries.</b> Abandoned — Village of Pownal water source. That portion of unnamed tributaries and their watersheds on Mann Hill in the Town of Pownal upstream of the water intake in Oak Hill Cemetery.	A2	A2	A2	A2	A2	A2	A2	B2	3/6/59	2.9 miles



Appendix F. WATER QUALITY CLASSIFICATIONS										
Waters	Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Reservoir Hollow Brook.</b> Abandoned — Village of North Pownal water source. Reservoir Hollow Brook and reservoir and all waters within its watershed. (Reservoir is approximately 0.5 mile upstream of the Hoosic River).	A2	A2	A2	A2	A2	A2	A2	B2	3/6/59	0.8 mile
<b>Ladd Brook.</b> Abandoned — Village of Pownal water source. Ladd Brook and all waters within its watershed in the Town of Pownal.	A2	A2	A2	A2	A2	A2	A2	B2	3/6/59	1.5 miles
<b>Poultney, Mettawee, Southern Lake Champlain (Basins 2 &amp; 4)</b>										
<b>Poultney River</b>										
<b>Inman Pond.</b> Permanent — Village of Fair Haven (WSID 5218) water source. Inman Pond and all waters within its watershed in Fair Haven.	A2	A2	A2	A2	A2	A2	A2	B2	6/15/67	79 acres (Pond only)
<b>Sucker Creek.</b> Abandoned — Village of Fair Haven water source. Sucker Creek and all waters within its watershed upstream of the Howard Dam and Sheldon Dam, both of which are located in Fair Haven.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	0.6 mile

Appendix F. WATER QUALITY CLASSIFICATIONS Waters	Aq. Biota	Aq.	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Otter Creek, Little Otter Creek, Lewis Creek (Basin 3)</b>										
<b>Upper Otter Creek</b>										
* <b>Surface waters of the Big Branch Wilderness Areas.</b> All streams, lakes, and ponds located within the boundaries of the federally-designated Big Branch Wilderness Areas of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 3
* <b>Surface waters of the Peru Peak Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally-designated Peru Peak Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 3
* <b>Surface waters of the Robert T. Stafford White Rocks National Recreation Areas.</b> All streams, lakes, and ponds located within the boundaries of the federally-designated Robert T. Stafford White Rocks National Recreation Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 3
<b>Unnamed tributary to Cold River.</b> Abandoned — City of Rutland water source. Unnamed tributary to Cold River and all waters within its watershed upstream of its diversion into the Mendon Brook watershed in Killington.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	2.0 miles
<b>Mendon Brook.</b> Permanent — City of Rutland (WSID 5229) water source. Mendon Brook and all waters within its watershed upstream of the water intake just south of Meadow Lake Drive in the Town of Mendon.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	6.0 miles

Appendix F. WATER QUALITY CLASSIFICATIONS										
Waters	Aq. Biota	Aq.	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Tenney Brook.</b> Abandoned — Rutland-Mendon Town water source. Tenney Brook and all waters with its watershed upstream of and including a small intake impoundment.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	2.0 miles
<b>Rutland City Reservoir.</b> Permanent — City of Rutland (WSID 5229) water source. Rutland City Reservoir in Rutland Town and all waters within its watershed in Rutland Town and Mendon.	A2	A2	A2	A2	A2	A2	A2	B2	Legis. <sup>1</sup>	No record
<b>Moon Brook.</b> Abandoned — Gleason Road water system. Moon Brook and all waters within its watershed in Mendon upstream of and including a small intake impoundment.	A2	A2	A2	A2	A2	A2	A2	B2	Legis. <sup>1</sup>	2.0 miles
<b>Unnamed tributary to Tenney Brook.</b> Abandoned — Gleason Road water system. Unnamed tributary to Tenney Brook and all waters within its watershed in Mendon upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	Legis. <sup>1</sup>	1.1 miles
<b>Young's Brook.</b> Abandoned — Village of West Rutland water source. Young's Brook and reservoir and all waters within its watershed in West Rutland and Ira upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	2.0 miles
<b>Furnace Brook and Kiln Brook.</b> Furnace Brook – Emergency; Kiln Brook – Abandoned — Village of Proctor (WSID 5228) water sources. Furnace Brook and Kiln Brook and all waters within their watersheds in Chittenden upstream of their confluence.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	5.5 miles

<sup>1</sup> These waters were classified as a result of 1949 and 7/1/71 legislation that defined what constituted Class A waters.  
Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A

Appendix F. WATER QUALITY CLASSIFICATIONS										
Waters	Aq. Biota	Aq.	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Sugar Hollow Brook.</b> Abandoned — Town of Brandon water source. Sugar Hollow Brook and all waters within its watershed in Goshen and Chittenden upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	2.0 miles
<b>Leicester Hollow Brook.</b> Abandoned — Town of Brandon water source. Leicester Hollow Brook and all waters within its watershed in Leicester upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	2.0 miles
<b>Lower Otter Creek</b>										
<b><u>Alder Brook.</u></b> Alder Brook and all waters within its watershed.	A1	A1	A1	B2	B2	B2	B2	B2	<sup>2</sup>	<u>12.2 miles</u>
<b><u>Blue Bank Brook.</u></b> Blue Bank Brook and all waters within its watershed.	A1	A1	A1	B2	B2	B2	B2	B2	<sup>2</sup>	<u>10.3 miles</u>
<b><u>Goshen Brook.</u></b> Goshen Brook and all waters within its watershed upstream to the boundaries of the federally designated Joseph Battell Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	B2	B2	B2	B2	B2	<sup>2</sup>	<u>1.5 miles</u>
<b>*Surface waters of the Breadloaf Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally-designated Breadloaf Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 1 and Map 2
<b>*Surface waters of the Bristol Cliffs Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally-designated Bristol Cliffs Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 1

<sup>2</sup> Effective as of adoption of these rules.

<p><b>*Surface waters of the Joseph Battell Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally-designated Joseph Battell Wilderness Area of the Green Mountain National Forest.</p>	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 1 and Map 2
<p>Appendix F. WATER QUALITY CLASSIFICATIONS</p> <p style="text-align: center;"><b>Waters</b></p>	<b>Aq. Biota</b>	<b>Aq.</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<p><b>*Surface waters of the Moosalamoo National Recreation Area.</b> All streams, lakes, and ponds located within the boundaries of the federally-designated <del>Mooselamoo</del> <u>Moosalamoo</u> National Recreation Area of the Green Mountain National Forest, <i>except</i> for all waters managed by the Silver Lake Hydroelectric Project, including Sugar Hill Reservoir (a.k.a. Goshen Dam), Sucker Brook Diversion Dam, Silver Lake, Dutton Brook downstream of the Sucker Brook Diversion, and Sucker Brook including all tributaries.</p>	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 1 and Map 2
<p><b>Brandy Brook.</b> Emergency – Middlebury College Breadloaf Campus (WSID 20866) water source. Brandy Brook and all waters within its watershed.</p>	A2	A2	A2	A2	A2	A2	A2	B2	11/13/61	1.0 mile
<p><b>Unnamed tributary to Beaver Meadow Brook.</b> Abandoned -- Village of Bristol water source. Unnamed tributary to Beaver Meadow Brook and all waters within its watershed upstream of the water intake in Lincoln.</p>	A2	A2	A2	A2	A2	A2	A2	B2	11/13/61	1.3 miles
<p><b>Unnamed tributary to Lewis Creek.</b> Abandoned -- Village of Starksboro water source. Unnamed tributary to Lewis Creek and all</p>	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	2.0 miles

waters within its watershed in Starksboro upstream of the water intake.											
<b>Two unnamed tributaries to Little Otter Creek.</b> Abandoned — City of Vergennes water source. Two unnamed tributaries to Little Otter Creek and all waters within their watersheds in Monkton and Bristol upstream of two water intakes.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.6 miles and 1.4 miles	
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq.</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>	
<b>Notch Brook.</b> Abandoned — Village of Middlebury water source. Notch Brook and all waters within its watershed upstream of the water intake in Bristol.	A2	A2	A2	A2	A2	A2	A2	B2	11/13/61	2.0 miles	
<b>Roaring Brook.</b> Emergency — Wallingford Village (WSID 5242) water source. Roaring Brook and all waters within its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	3.3 miles	
<b>Northern Lake Champlain (Basin 5)</b>											
<b>Lake Champlain including Minor Tributaries</b>											
<b>Milton Pond.</b> Abandoned — Village of Milton water source. Milton Pond and all waters within its watershed in Milton.	A2	A2	A2	A2	A2	A2	A2	B2	3/21/68	20 acres (Pond only)	
<b>Indian Brook Reservoir.</b> Abandoned — Essex Town water source. Indian Brook Reservoir and all waters within its watershed in Essex Town.	A2	A2	A2	A2	A2	A2	A2	B2	3/21/68	95 acres (Reservoir only)	

<p><b>Colchester Pond.</b> Abandoned — Village of Colchester water source. Colchester Pond and all waters within its watershed in the Town of Colchester.</p>	A2	A2	A2	A2	A2	A2	A2	A2	B2	3/21/68	93 acres (Pond only)
<p>Appendix F. WATER QUALITY CLASSIFICATIONS <b>Waters</b></p>	<b>Aq. Biota</b>	<b>Aq.</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public, WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>	
<p><b>St. Albans Bay</b></p>											
<p><b>Mill River.</b> Permanent — City of St. Albans (WSID 5130) water source. Two reservoirs which drain to the Mill River and all waters within their watersheds in the Towns of Fairfax, St. Albans, and Fairfield. Locally known as Fairfax Reservoir.</p>	A2	A2	A2	A2	A2	A2	A2	B2	6/28/54	62 acres (Reservoir only)	
<p><b>Missisquoi (Basin 6)</b></p>											
<p><b>Missisquoi River</b></p>											
<p><b>Mountain Brook and tributary.</b> Abandoned — Village of North Troy water source. Mountain Brook and a tributary and all waters within their watersheds upstream of two separate water intakes in Jay.</p>	A2	A2	A2	A2	A2	A2	A2	B2	5/28/70	1.6 miles and 1.1 miles	
<p><b>Coburn Brook Reservoir and tributaries.</b> Abandoned — Village of Troy water source. Coburn Brook and Coburn Brook Reservoir in Westfield and all waters within their watersheds upstream of the water intake in Coburn Brook.</p>	A2	A2	A2	A2	A2	A2	A2	B2	5/28/70	2.0 miles	

<b>Unnamed tributary to Trout River.</b> Abandoned — Village of East Berkshire water source. Unnamed tributary to the Trout River in Enosburg and all waters within its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	5/28/70	0.6 mile
<b>Hannah Clark Brook.</b> Abandoned — Village of Montgomery Center water source. Hannah Clark Brook in Montgomery and all waters in its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	5/28/70	4.0 miles
Appendix F. WATER QUALITY CLASSIFICATIONS  Waters	<u>Aq. Biota</u>	<u>Aq.</u>	<u>Aesthetics</u>	<u>Boating</u>	<u>Fishing</u>	<u>Swimming</u>	<u>Public WS</u>	<u>Irrigation</u>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Stanhope Brook.</b> Permanent — Village of Richford (WSID 5216) water source. Stanhope Brook in Richford and all waters in its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	5/28/70	5.0 miles
<b>Trout Brook.</b> Abandoned — Village of Enosburg Falls water source. Trout Brook in Berkshire and all waters within its watershed upstream of the outlet of Enosburg Reservoir.	A2	A2	A2	A2	A2	A2	A2	B2	5/28/70	2.0 miles
<b>Loveland Brook.</b> Emergency — Village of Richford (WSID 5126) water source. Loveland Brook in Richford and all waters within its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	2.0 miles
<b>Black Falls Brook.</b> Abandoned — Village of Montgomery Center water source. Black Falls Brook in Montgomery and Richford and all waters within its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	5.0 miles
<b>Lamoille (Basin 7)</b>										
<b>Lamoille River</b>										



<b>Smith Brook.</b> Abandoned — Village of Johnson water source. Smith Brook in Johnson and all waters in its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.6 miles
<b>French Hill Brook.</b> Emergency — Village of Johnson (WSID 5156) water source. French Hill Brook in Johnson and all waters in its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	2.4 miles
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq.</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>SwSwimmi</b>	<b>Public WS</b>	<b>Irrigateion</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Silver Lake.</b> Emergency — City of St. Albans (WSID 5130) water source. Silver Lake and all waters in its watershed in the Towns of Georgia and Fairfax.	A2	A2	A2	A2	A2	A2	A2	B2	2/13/70	30 acres (Lake only)
<b>Unnamed tributary to the Lamoille River.</b> Abandoned — Village of Hardwick water source. Unnamed tributary to the Lamoille River and all waters in its watershed in Hardwick upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.0 mile
<b>Unnamed tributary to the Lamoille River.</b> Abandoned — Village of Fairfax water source. Unnamed tributary to the Lamoille River and all waters in its watershed in Fairfax upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	0.1 mile
<b>Winooski (Basin 8)</b>										
<b>Lower Winooski River</b>										
<b>Unnamed tributary to Alder Brook.</b> Abandoned — Former water source for Winooski, Essex Center, Essex Junction, and Pinewood Manor. Unnamed tributary and all waters within its watershed in Essex.	A2	A2	A2	A2	A2	A2	A2	B2	6/6/69	0.4 mile

Middle Winooski River																				
*Surface waters of the Breadloaf Wilderness. All streams, lakes, and ponds located within the boundaries of the federally-designated Breadloaf Wilderness Area of the Green Mountain National Forest.										A1	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 1
Appendix F. WATER QUALITY CLASSIFICATIONS Waters										Aq. Biota	Aq.	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres	
Unnamed tributaries to Thatcher Brook. Tyler Brook – Permanent; Merriam Brook – Permanent – Village of Waterbury (WSID 5284) water sources. Unnamed tributaries to Thatcher Brook (known locally as Tyler and Merriam Brooks) and all waters upstream of the intakes in Stowe.										A2	A2	A2	A2	A2	A2	A2	A2	B2	5/14/63	2.5 miles
Unnamed tributary to the West Branch of the Little River. Abandoned – Village of Stowe water source. An unnamed tributary to the West Branch of the Little River and all waters within its watershed in Stowe to the water intake.										A2	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.3 miles
Stevens Branch																				
Martin Brook, Reservoir, and tributaries. Abandoned – City of Barre water source. Martin Brook in Williamstown and all waters within its watershed, including unnamed tributaries, to the water intake.										A2	A2	A2	A2	A2	A2	A2	A2	B2	8/7/69	3.5 miles
Bolster Reservoir and tributaries. Abandoned – Old City of Barre water source. Bolster Reservoir in South Barre and all waters within										A2	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	2.0 acres (Reservoir) and 2.2 miles tributaries

its watershed including Bolster Reservoir Brook, Pecks Pond, and unnamed tributaries.										
Appendix F. WATER QUALITY CLASSIFICATIONS  Waters	<u>Aq. Biota</u>	<u>Aq.</u>	<u>Aesthetics</u>	<u>Boating</u>	<u>Fishing</u>	<u>Swimming</u>	<u>Public WS</u>	<u>Irrigation</u>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Thurman W. Dix Reservoir, Lower Reservoir, and tributaries.</b> Orange Reservoir – Permanent; Dix Reservoir – Permanent – City of Barre (WSID 5254) water sources. Thurman W. Dix Reservoir, Lower Reservoir, and all waters within their watersheds in the Towns of Barre and Orange including Orange Brook, Nelson Brook, Nate Smith Brook, and unnamed tributaries.	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	119 acres and 9.9 miles
<b>Unnamed brook and tributaries.</b> Abandoned – Village of East Barre water source. Unnamed brook and tributaries in the Town of Barre and all waters within their watersheds to the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	1.4 miles
<b>Little John and Milne Quarries.</b> Abandoned – Village of East Barre water sources. Little John Quarry and Milne Quarries in Barre Town (located southwest of East Barre Village).	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	No record
<b>Consolidated Quarries.</b> Barclay Quarry – Permanent; Quarry Hole #1 – Permanent; Capital Quarry – Emergency – Websterville (WSID 5247) water sources. When Barclay Quarry is low and demand is high, water is pumped from Quarry Hole #1 directly into the Barclay Quarry. Barclay Quarry is also known as Jones Brothers Quarry.	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	No record
<b>Old Granite Quarry.</b> Abandoned – Town of Barre water source located south of Websterville. Locally known as Standard Quarry.	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	No record

<b>Berlin Pond.</b> Permanent — City of Montpelier (WSID 5272) water source. Berlin Pond upstream of the dam and all waters within its watershed in the Towns of Berlin, Northfield, and Williamstown. The dam is located 300' downstream of where Paine Turnpike crosses the pond.	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	256 acres
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq.</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>White River (Basin 9)</b>										
<b>White River</b>										
<b>*Surface waters of the Breadloaf Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the <del>federally-designated</del> <u>federally designated</u> Breadloaf Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 1 and Map 2
<b>*Surface waters of the Joseph Battell Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the <del>federally-designated</del> <u>federally designated</u> Joseph Battell Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 2
<b>*Bingo Brook.</b> Bingo Brook and tributaries from headwaters downstream to the Green Mountain National Forest boundary above Kings Pond (Hancock/Rochester).	A1	A1	B2	A1	A1	B2	B2	B2	01/15/17	33.3 MILES
<b>*Smith Brook.</b> Smith Brook and tributaries from headwaters downstream to Rt. 73.	A1	A1	B2	B2	A1	B2	B2	B2	01/15/17	6.8 MILES
<b>*Beaver Meadows Ponds.</b> All ponds and tributaries, beginning from headwaters, and ending at outlet of downstream most pond.	A1	A1	B2	B2	B2	B2	B2	B2	01/15/17	1.5 MILES

<b>Farnsworth Brook.</b> Abandoned — Village of East Braintree water source. Farnsworth Brook and all waters within its watershed in the Town of Braintree upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	12/28/7 7	2.0 miles
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b>  <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq.</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Lake Casper and Lake John.</b> Lake Casper – Abandoned; Lake John – Permanent — Village of South Royalton (WSID 5330) water sources. Lake Casper and Lake John and all waters within their watersheds in the Town of Royalton. Water is pumped from the Carpenter Field infiltration gallery in the White River up to Lake John.	A2	A2	A2	A2	A2	A2	A2	B2	12/28/7 7	No record
<b>Ottawaquechee, Black (Basins 10 &amp; 13)</b>										
<b>Ottawaquechee River</b>										
<b>Spring and unnamed tributary to the Ottawaquechee River.</b> Abandoned — Village of North Hartland water source. A spring and unnamed tributary to the Ottawaquechee River and all waters within its watershed upstream of the water intake. The spring and brook are located approximately 1 mile north-northwest of North Hartland Village.	A2	A2	A2	A2	A2	A2	A2	B2	11/16/6 7	0.3 mile
<b>Cox, Vondell, and Carlton Hill Reservoirs.</b> Cox and Vondell – Emergency; Carlton Hill – Abandoned — Village of Woodstock (WSID 5342) water sources. Cox, Vondell, and Carlton Hill Reservoirs in the Town of Woodstock and all waters within their watersheds.	A2	A2	A2	A2	A2	A2	A2	B2	11/16/6 7	2.5 miles (Stream only)

<b>Grant Brook (off Jewell Brook).</b> Abandoned — Village of Ludlow water source. Grant Brook and all waters within its watershed upstream of the flood control dam.	A1	A1	A1	A1	A1	A1	A2	B2	3/30/66	3.2 miles
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq.</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Wright, Upper Hurricane, and Lower Hurricane Reservoirs.</b> Wright – Emergency; Hurricane – Abandoned — Hartford Town (WSID 5319) water sources. Wright, Upper Hurricane, and Lower Hurricane Reservoirs and all waters within their watersheds in the Town of Hartford.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	10.4 acres
<b>Black River</b>										
<b>Springfield Reservoir Brook.</b> Abandoned — Village of Springfield water source. Springfield Reservoir Brook and tributaries and all waters in its watershed upstream of Springfield Reservoir.	A2	A2	A2	A2	A2	A2	A2	B2	3/30/66	1.8 miles
<b>Springfield Reservoir and tributaries.</b> Abandoned — Village of Springfield water source. Springfield Reservoir all waters within its watershed.	A2	A2	A2	A2	A2	A2	A2	B2	3/30/66	9.8 acres
<b>Unnamed tributary to Mill Brook.</b> Abandoned — Village of Ascutney water source. Unnamed tributary to Mill Brook and all waters in its watershed above the water intake. The unnamed tributary is the first tributary to Mill Brook in the Town of Weathersfield.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.7 miles
<b>West, Williams, Saxtons (Basins 11 &amp; 13)</b>										

West, Williams, and Saxtons Rivers										
*Surface waters of the Peru Peak Wilderness. All streams, lakes, and ponds located within the boundaries of the <del>federally-designated</del> <u>federally designated</u> Peru Peak Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 3
Appendix F. WATER QUALITY CLASSIFICATIONS  Waters	<u>Aq. Biota</u>	<u>Aq.</u>	<u>Aesthetics</u>	<u>Boating</u>	<u>Fishing</u>	<u>Swimming</u>	<u>Public WS</u>	<u>Irrigation</u>	<u>Date</u>	<u>Approx. Miles/Acres</u>
*Surface waters of the Robert T. Stafford White Rocks National Recreation Areas. All streams, lakes, and ponds located within the boundaries of the <del>federally-designated</del> <u>federally designated</u> Robert T. Stafford White Rocks National Recreation Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 3
*Surface waters of the Lye Brook Wilderness. All streams, lakes, and ponds located within the boundaries of the <del>federally-designated</del> <u>federally designated</u> Lye Brook Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 3
*Mount Tabor Brook. Mount Tabor Brook from headwaters in the Peru Peak Wilderness and Robert T. Stafford White Rocks National Recreation area, and tributaries, downstream to confluence with Utley Brook.	A1	A1	B2	B2	A1	B2	B2	B2	01/15/17	7.2 MILES
*Moses Pond. Moses Pond including upstream tributaries.	A1	A1	B2	B2	B2	B2	B2	B2	01/15/17	12 acres
Sunset Lake and Stickney Brook. Sunset Lake – Permanent; Stickney Brook – Permanent – Town of Brattleboro (WSID 5290) water source. Sunset Lake, Langlie Brook, Kelly Brook, and Stickney Brook and all waters in their watersheds above the water diversions in	A2	A2	A2	A2	A2	A2	A2	B2	7/26/78	3.0 sq. miles

the Towns of Dummerston, Marlboro, Newfane, and Brattleboro. (Also refer to the classification of Pleasant Valley Reservoir — Basin 13).										
<b>Styles Brook.</b> Abandoned — Stratton Corp. water source. Styles Brook and all waters in its watershed above the diversion to Styles Reservoir.	A2	A2	A2	A2	A2	A2	A2	B2	7/26/78	1.0 sq. mile
Appendix F. WATER QUALITY CLASSIFICATIONS  Waters	Aq. Biota	Aq.	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Chester Reservoir and the outlet stream above the water intake.</b> Emergency — Village of Chester (WSID 5318) water source. Chester Reservoir, the outlet stream above the water intake, and all waters within their watersheds in the Town of Chester. The water intake is approximately 0.3 mile below the reservoir. Locally known as Pierce Brook Reservoir.	A2	A2	A2	A2	A2	A2	A2	B2	7/26/78	1.0 sq. mile
<b>Bolles Brook (renamed Signal Hill Brook in 2016 by the Vermont Department of Libraries).</b> Emergency — Vermont Academy (WSID 5303) water source. Abandoned — Village of Saxtons River. Bolles/Bowles Pond Brook (now Signal Hill Brook) and all waters in its watershed above the water intake in the Town of Rockingham.	A2	A2	A2	A2	A2	A2	A2	B2	7/26/78	1.0 sq. mile
<b>Kidder Brook and tributaries.</b> That portion of Kidder Brook and all its headwaters, including named and unnamed tributaries, beginning in the Town of Stratton at an elevation of 2,500 feet and continuing downstream to its confluence with the North Branch in the Town of Jamaica.	A1	A1	A1	A1	A1	A1	B2	B2	10/11/89	2.5 miles
	A1	A1	A1	A1	A1	A1	B2	B2	10/09/91	6.0 miles



<p><b>Cobb Brook.</b> That portion of Cobb Brook and its tributaries beginning in the Town of Windham at an elevation of 2,500 feet and continuing downstream to its confluence with the West River in the Town of Jamaica.</p>										
<p>Appendix F. WATER QUALITY CLASSIFICATIONS</p> <p style="text-align: center;"><b>Waters</b></p>	<p style="text-align: center;"><b>Aq. Biota</b></p>	<p style="text-align: center;"><b>Aq.</b></p>	<p style="text-align: center;"><b>Aesthetics</b></p>	<p style="text-align: center;"><b>Boating</b></p>	<p style="text-align: center;"><b>Fishing</b></p>	<p style="text-align: center;"><b>Swimming</b></p>	<p style="text-align: center;"><b>Public WS</b></p>	<p style="text-align: center;"><b>Irrigation</b></p>	<p style="text-align: center;"><b>Date</b></p>	<p style="text-align: center;"><b>Approx. Miles/Acres</b></p>
<p><b>Upper Reach of the Winhall River.</b> That portion of the upper reach of the Winhall River including the river's two principal headwaters, beginning at an elevation of 2,500' in the Town of Stratton, and continuing downstream a distance of approximately 7.4 miles to the point at which the river crosses the current boundary of the Green Mountain National Forest in the Town of Winhall.</p>	<p style="text-align: center;">A1</p>	<p style="text-align: center;">A1</p>	<p style="text-align: center;">A1</p>	<p style="text-align: center;">A1</p>	<p style="text-align: center;">A1</p>	<p style="text-align: center;">A1</p>	<p style="text-align: center;">B2</p>	<p style="text-align: center;">B2</p>	<p style="text-align: center;">10/09/91</p>	<p style="text-align: center;">7.4 miles</p>
<p><b>Back Pond/Minards Pond.</b> Permanent — Village of Bellows Falls (WSID 5298) water source. Back Pond and all water within its watershed, which is diverted to Minards Pond. Back Pond is located 0.1 mile northwest of Minards Pond in the Town of Rockingham.</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">B2</p>	<p style="text-align: center;">3/21/68</p>	<p style="text-align: center;">2.0 acres</p>
<p><b>Ellis Brook.</b> Permanent — Village of Bellows Falls (WSID 5298) water source. Ellis Brook and all waters in its watershed above the water intake, which is situated at elev. 715' MSL in the Town of Rockingham.</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">B2</p>	<p style="text-align: center;">7/1/71</p>	<p style="text-align: center;">246 acres (watershed)</p>
<p><b>Farr Brook.</b> Permanent — Village of Bellows Falls (WSID 5298) water source. Farr Brook and all waters in its watershed above the water intake, which is located at elev. 710' MSL in the Town of Rockingham.</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">A2</p>	<p style="text-align: center;">B2</p>	<p style="text-align: center;">7/1/71</p>	<p style="text-align: center;">154 acres (watershed)</p>

<b>Mill Brook.</b> Emergency — Kurn Hattin School (WSID 5452) water source. Mill Brook and all water within its watershed above the water intake in the Town of Westminster. The intake is located approximately 1.0 miles upstream of its confluence with the Connecticut River.	A2	A2	A2	A2	A2	A2	A2	B2	3/21/68	3.0 miles
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq.</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Deerfield (Basins 12 &amp; 13)</b>										
<b>Deerfield River</b>										
<b>*Surface waters of the Glastenbury Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the <del>federally-designated</del> <u>federally designated</u> Glastenbury Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 4
<b>*Surface waters of the George D. Aiken Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the <del>federally-designated</del> <u>federally designated</u> George D. Aiken Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 4
<b>*Upper Deerfield River.</b> Deerfield River and tributaries beginning upstream of the confluence of the Rake Branch watershed, including the Castle Brook and Glastenbury River watersheds.	A1	A1	B2	B2	A1	B2	B2	B2	01/15/17	88.7 miles
<b>*Stamford Pond.</b> Stamford Pond and upstream tributaries.	A1	A1	B2	B2	B2	B2	B2	B2	01/15/17	12 acres

<p><b>Haystack Pond.</b> Permanent — Village of Wilmington (WSID 5310) water source. Haystack Pond and all waters within its watershed in the Town of Wilmington.</p>	A2	A2	A2	A2	A2	A2	A2	B2	1/27/61	36 acres
<p>Appendix F. WATER QUALITY CLASSIFICATIONS <b>Waters</b></p>	<b>Aq. Biota</b>	<b>Aq.</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<p><b>Howe Pond and Howe Pond Brook.</b> Permanent — Village of Readsboro (WSID 5028) water source. Howe Pond and all waters within its watershed. Howe Pond Brook and all waters within its watershed above the water intake, which is located approximately 1.1 miles downstream from Howe Pond. Both pond and brook are located in the Town of Readsboro.</p>	A2	A2	A2	A2	A2	A2	A2	B2	1/27/61	62 acres
<p><b>Cold Brook and tributaries.</b> That portion of Cold Brook and its tributaries between an elevation of 2,500 feet and continuing downstream to its confluence with Mountain Brook in the Town of Dover.</p>	A1	A1	A1	A1	A1	A1	B2	B2	10/7/96	1.5 miles
<p><b>Pleasant Valley Reservoir.</b> Permanent — Town of Brattleboro (WSID 5290) water source. Pleasant Valley Reservoir and all waters in its watershed in the Town of Brattleboro. Langlie, Kelly, and Stickney Brook diversions send their waters to Pleasant Valley Reservoir. (Also refer to the classification of Sunset Lake &amp; Stickney Brook — Basin 11)</p>	A2	A2	A2	A2	A2	A2	A2	B2	3/21/68	25 acres
<p><b>Stevens, Wells, Waits, Ompompanoosuc (Basins 14 &amp; 16)</b></p>										

<p><b>Mill Pond Brook.</b> Abandoned — Village of Bradford water source. Mill Pond Brook and all waters within its watershed above the intake dam in the Towns of Fairlee, Bradford, and West Fairlee. Locally known as the Brushwood Impoundment.</p>	A2	A2	A2	A2	A2	A2	A2	B2	2/19/60	3.0 miles
<p>Appendix F. WATER QUALITY CLASSIFICATIONS Waters</p>	<u>Aq. Biota</u>	<u>Aq.</u>	<u>Aesthetics</u>	<u>Boating</u>	<u>Fishing</u>	<u>Swimming</u>	<u>Public WS</u>	<u>Irrigation</u>	<u>Date</u>	<u>Approx. Miles/Acres</u>
<p><b>Artificial impoundment on South Peacham Hollow Brook.</b> Abandoned — Peacham water source. An artificial impoundment on South Peacham Hollow Brook, and all waters within its watershed above the intake. The impoundment is located approximately 1/2 mile east of Fosters Road in the Town of Peacham.</p>	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	No record
<p><b>Charles Brown Brook.</b> Abandoned — Village of Norwich water source. Charles Brown Brook and all waters within its watershed above the water intake in the Town of Norwich.</p>	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	2.5 miles
<p><b>Unnamed tributary to Connecticut River.</b> Emergency — Village of Newbury (WSID 5175) water source. An unnamed tributary to the Connecticut River and all waters within its watershed above the water intake in the Town of Newbury. The tributary is approximately one mile south of Pulaski Mountain. The intake is located approximately 0.7 mile upstream of its confluence with the Connecticut River.</p>	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.0 mile
<p><b>Unnamed tributary to Lake Morey.</b> Abandoned — Village of Fairlee water source. An unnamed tributary to Lake Morey and all</p>	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.1 miles

waters in its watershed in the Town of Fairlee to the water intake dam, including a man-made impoundment.											
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq.</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>	
<b>Passumpsic (Basin 15)</b>											
<b>Passumpsic River</b>											
<b>Unnamed tributary to Miller Run including Mathewson Reservoir.</b> Abandoned — Village of Lyndonville water source. Unnamed tributary to Miller Run including Mathewson Reservoir and all waters within their watersheds above the intake in the Towns of Lyndon and Sutton.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	1.5 miles	
<b>Unnamed tributary to Miller Run including Copeland Reservoir.</b> Abandoned — Village of Lyndonville water source. Unnamed tributary to Miller Run including Copeland Reservoir and all waters within their watersheds above the intake in the Towns of Lyndon and Sutton.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	1.5 miles	
<b>Two unnamed tributaries to Sutton River.</b> Abandoned — Unknown water source. Two unnamed tributaries to the Sutton River, near West Burke, and all waters within their watersheds above the intakes.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	0.8 mile	

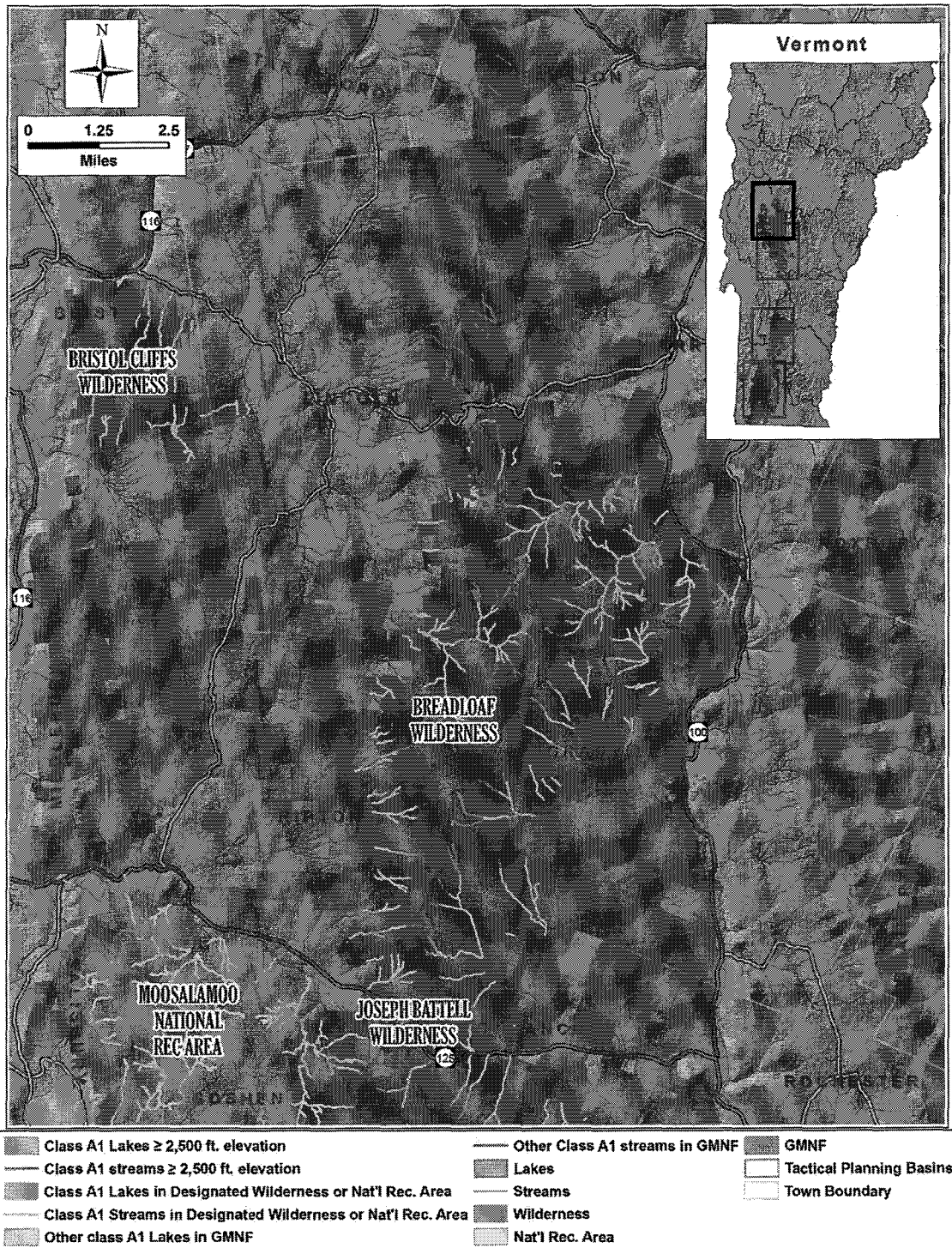
<b>Chandler Pond.</b> Abandoned — Lyndonville Village water source. Chandler Pond and all waters within its watershed in the Town of Wheelock. Wheelock Pond drains to the South Wheelock Branch.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	59 acres
<b>Woodworth Reservoir.</b> Abandoned — Lyndonville water source. Woodworth Reservoir and all waters within its watershed in the Town of Lyndon. Woodworth Reservoir flows to the South Wheelock Branch.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	No record
Appendix F. WATER QUALITY CLASSIFICATIONS  Waters	<u>Aq. Biota</u>	<u>Aq.</u>	<u>Aesthetics</u>	<u>Boating</u>	<u>Fishing</u>	<u>Swimming</u>	<u>Public WS</u>	<u>Irrigation</u>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Stiles Pond.</b> Permanent — St. Johnsbury Village (WSID 5045) water source. Stiles Pond and all waters within its watershed in the Town of Waterford. Stiles Pond is in the St. Johnsbury municipal forest and flows to the Moose River.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	5.5 miles and 146 acres (Stiles Pond)
<b>Danville Reservoir.</b> Emergency — Danville (WSID 5037) water source. Danville Reservoir on tributary of Brown Brook and all waters within its watershed in Danville.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	2.0 miles
<b>Upper Connecticut, Nulhegan, Willard Stream, Paul Stream (Basin 16)</b>										
<b>Unnamed tributary to Connecticut River.</b> Abandoned — Village of Bloomfield water source. An unnamed tributary to the Connecticut River and all waters within its watershed above the water intake in the Town of Bloomfield. The intake is approximately 0.5 mile above “Basin Hole.”	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	0.2 mile
<b>Lake Memphremagog, Black, Barton, Clyde, Coaticook (Basin 17)</b>										

Lake Memphremagog and International Stream										
Unnamed reservoir near Derby Line. Reservoir and all waters in its watershed in the Town of Derby.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	No record
Appendix F. WATER QUALITY CLASSIFICATIONS Waters	Aq. Biota	Aq.	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
May Pond Brook and May Pond. Permanent — Village of Barton (WSID 5189) water source. May Pond Brook and all waters within its watershed in the Town of Barton above and including the water source reservoir and May Pond. The reservoir is located approximately ¾ mile upstream of the brook's confluence with Crystal Lake.	A2	A2	A2	A2	A2	A2	A2	B2	10/30/87	13 acres
Black, Barton, Clyde Rivers										
Unnamed tributary to the Black River. Abandoned — Coventry water source. An unnamed tributary to the Black River and all waters within its watershed above the water intake in the Town of Coventry.	A2	A2	A2	A2	A2	A2	A2	B2	2/20/75	1.0 mile
Unnamed tributary to Island Pond. Permanent — Town of Brighton (WSID 5105) water source. An unnamed tributary to Island Pond and all waters within its watershed in the Town of Brighton above the water intake at approx. approx. elev. of 1544.0' MSL. The tributary flows northerly to Island Pond. Locally known as Brook #1.	A2	A2	A2	A2	A2	A2	A2	B2	2/20/75	1.0 mile
Unnamed tributary to Lightning Brook. Permanent — Town of Brighton (WSID 5105) water source. Two unnamed tributaries to an unnamed tributary to Lightning Brook and all waters in their watersheds in the Town of Brighton above the intakes. The main	A2	A2	A2	A2	A2	A2	A2	B2	2/20/75	2.0 miles

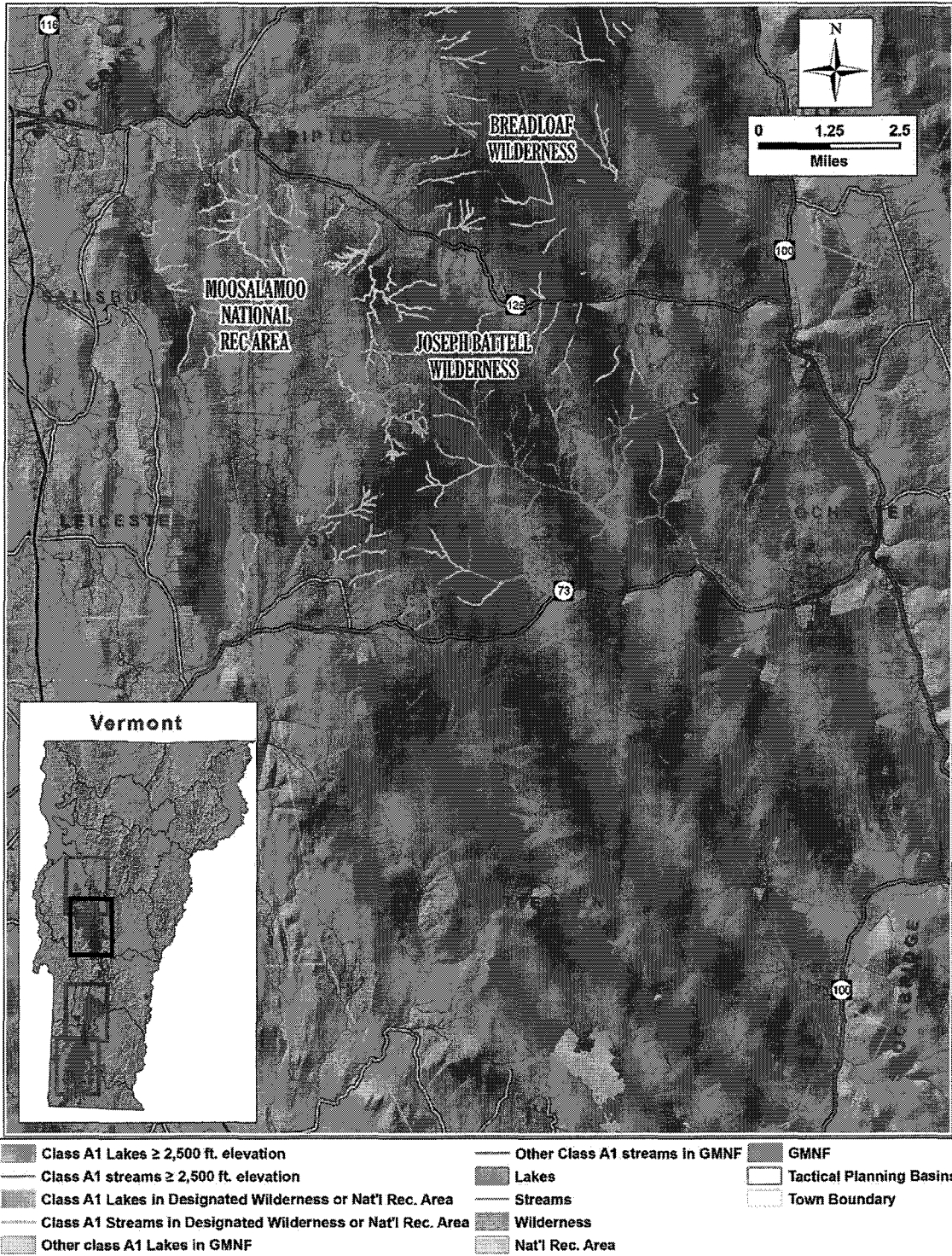
intake is at approx. elev. 1526.0' MSL, and the upper, more northerly intake is diverted to the main intake. Locally known as Brook #2.

--	--	--	--	--	--	--	--	--	--	--



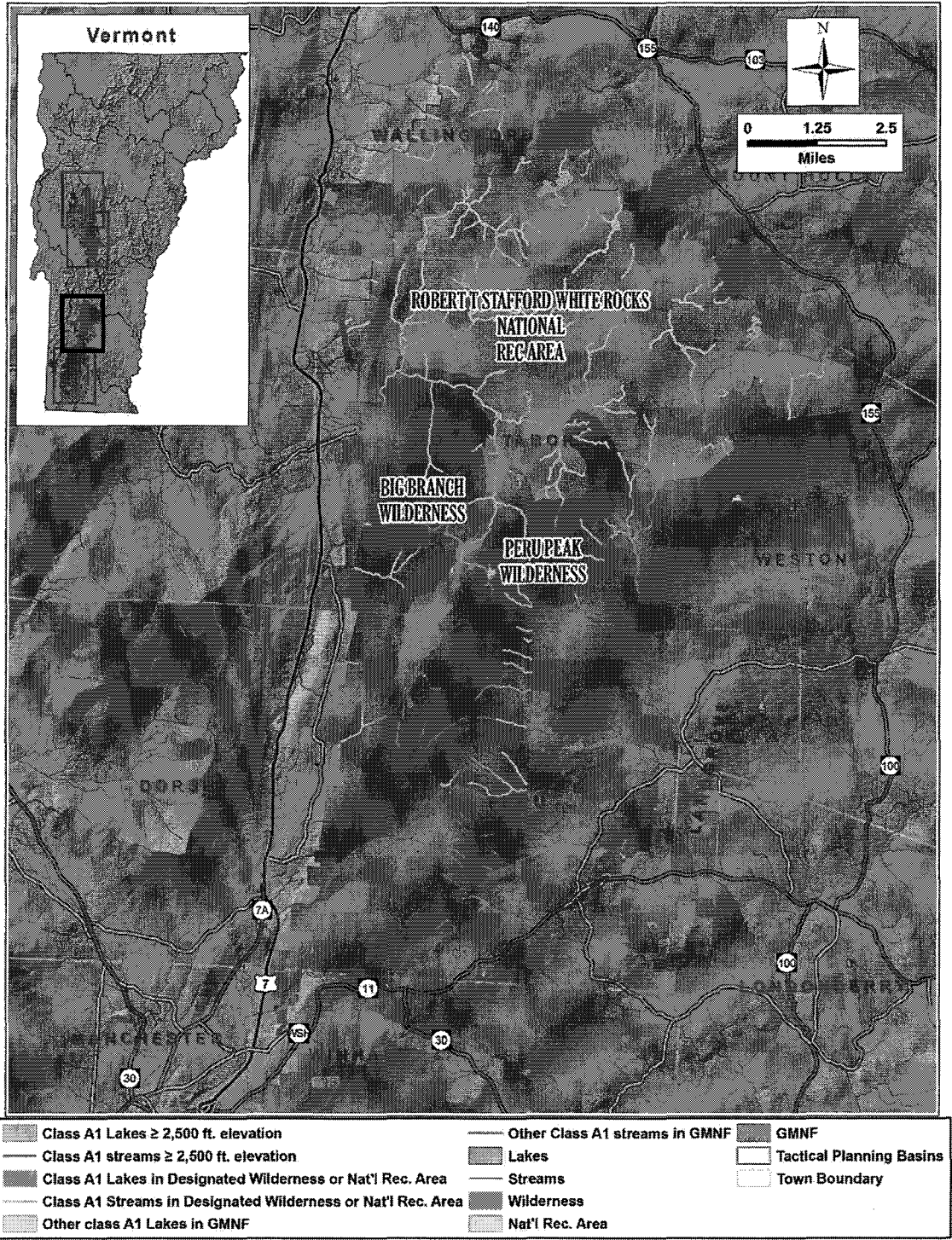


Map 1. Class A(1) surface waters in the Green Mountain National Forest – Breadloaf Area.  
 Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A



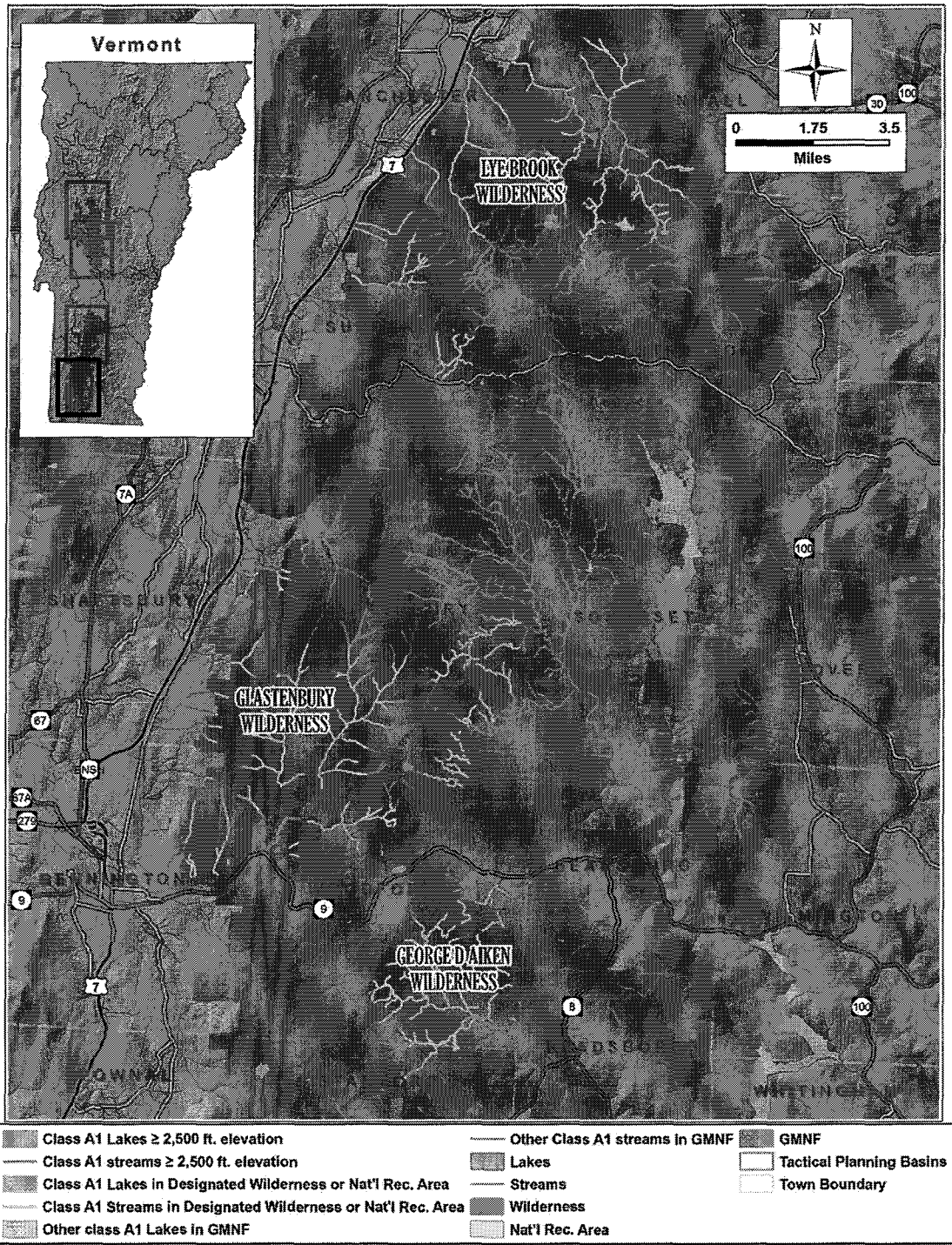
Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A

Map 2. Class A(1) surface waters in the Green Mountain National Forest, Moosalamoo, and Battell Areas.



Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A

Map 3. Class A(1) surface waters in the Green Mountain National Forest – White Rocks/Big Branch/Peru Areas.



Map 4. Class A(1) surface waters in the Green Mountain National Forest – Lye Brook and Glastenbury areas.

Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A

## Appendix G. APPLICATION OF BIOCRITERIA FOR FISH AND MACROINVERTEBRATE COMMUNITIES IN VERMONT WADEABLE STREAMS AND RIVERS

### Introduction

Section 29A-305 of ~~these~~ this rules states that the Secretary ~~may~~ shall establish and apply numeric biological ~~indices~~ indexes to determine whether there is support of the aquatic biota use for each class of water. This appendix incorporates into these rules procedures for the collection and analysis of fish and aquatic macroinvertebrate community data used to determine compliance with the class-specific narrative criteria included in § 29A-306(a) of these rules.

Community metrics and Indexes of Biotic Integrity (IBIs) have been developed expressly for Vermont wadeable rivers and streams to measure the biological integrity of each community. High biological integrity corresponds to a high degree of similarity to the natural condition. The natural condition was determined for each stream type by analyzing fish and macroinvertebrate ~~data on~~ community structure and function from Vermont waters least affected by human activities. In order of increasing departure from the natural condition of fish and macroinvertebrate communities, waters are categorized as Excellent — Class A(1), Very Good — Class B(1), and Good — Class (B2)<sup>3</sup>. Guidance on this appendix is provided on the Department's website at: <http://dec.vermont.gov/watershed/map/monitor/biomonitoring>.

### Macroinvertebrate Community Biocriteria

*Macroinvertebrate Community Types.* Stream macroinvertebrate community types are largely differentiated based on streambed gradient, which dictates substrate coarseness. Moderate to high gradient streams are dominated by gravel to boulder size material, while low gradient streams are dominated by silt and sand bottoms. Three community types have been identified from moderate and high gradient riffle habitats ~~and are differentiated based on largely on~~ sample site drainage area and elevation. They are “Small High Gradient (SHG),” “~~Moderate-Medium~~ High Gradient (MHG),” and “Warm Water Moderate Gradient (WWMG).” Two low gradient communities are differentiated by ~~the presence or absence of gravel habitat characteristics in the sand- and silt dominated~~ substrate streams. They are “Hybrid Low Gradient (HLG),” and “Slow Low Gradient (SLG)” respectively. Community types are assessed with different combinations of biological criteria and different scales of metric scoring. Community metrics are ~~scored~~ assessed *independently* for the three moderate ~~to~~ and high gradient (riffle habitat) community types. The two low gradient community types are assessed using ~~calculated~~ Indexes of Biotic Integrity (IBIs), in which individual metric ~~values~~ scores are summed to produce a *single index value*.

*Macroinvertebrate Community Sampling Methods.* The macroinvertebrate biocriteria are applicable to wadeable streams. For moderate ~~and~~ to high gradient communities, a bottom kick-net shall be used to sample four representative riffle habitats from a given stream reach. The four sub-samples

---

<sup>3</sup> For waters in which the aquatic biota and wildlife use is classified as A(2), the metrics for Class B(2) waters shall apply.

Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A

shall be composited into a single sample. For low gradient communities, a sample shall consist of a composite of four kick-net sweeps or jabs into ~~logs~~logs, woody debris, root wads, macrophytes and or submerged stream-side vegetation.

Samples shall be preserved in the field and processed in the lab to remove macroinvertebrates from plant and mineral detritus. A minimum of ~~at least~~ 25% of the sample shall be processed to ensure accurate community metric calculations. If 300 organisms are not removed in the initial 25% subsample, the subsample size shall be incrementally expanded until a minimum of 300 organisms are removed. All macroinvertebrates removed shall be identified by taxonomists to the lowest practical level, with a target level of genus or species for most organisms.

### **Moderate-Medium to and High Gradient "Riffle Habitat" Macroinvertebrate Metrics**

The biological integrity of macroinvertebrate communities in moderate to high gradient streams shall be evaluated using an independent multi-metric scoring system calibrated for each of the three stream community types: SHG, MHG, and WWMG (Tables A-1, A-2, and A-3). Threshold values for each community type have been established for each metric that correspond to increasing levels of departure from the natural condition. In a site ~~evaluation~~assessment, the metric or metrics with the greatest departure from natural condition (lowest level of quality) shall be used to assign the community to a level of biological integrity ranging from Poor to Excellent.

*Scoring Community Data.* Each threshold metric value identifies a level of biological integrity: Excellent, Very Good, ~~and Good~~, or failing to fully support aquatic biota (Fair or Poor). Metric values from a macroinvertebrate community assessment that fall within a specified range immediately below a threshold indicate an "indeterminate" finding for that metric being intermediate between that level and the next lower level.

An assessment of metric values consists of a systematic comparison of each value against threshold criteria for each level, beginning with Excellent, using the following procedure:

- (1) The biological integrity of the community shall achieve classification criteria A(1), B(1), or B(2) when all metrics are at or above the ~~quality~~ threshold for that class.
- (2) When one or more metrics fall below the threshold "indeterminate" range, all metric values shall be compared to the next lower level of biological integrity until (1) above is met.
- (3) If neither (1) nor (2) above are met, an "indeterminate" finding shall be made for that assessment. An indeterminate finding shall result in a transitional assessment rating between the level the site is indeterminate for and the one immediately below that (e.g. Fair/Good ~~to or~~ Good/Very Good).
- (4) ~~An outcome determination of "indeterminate" for a single metric may be adjusted upward to meet the threshold for a class or be lowered downward to non-support for a class, if it is determined~~ documented by the biologist that the "indeterminate" finding metric value is due to an aberration in not representative of the macroinvertebrate community composition. For example,

Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A



this could be due to an unusual hyper-dominance of a taxon in its early stages of development.

Table A-1. Macroinvertebrate community metrics for Small High Gradient (SHG) Vermont streams macroinvertebrate communities.

SHG Metric		Biological Integrity		
		Excellent A(1)	Very Good B(1)	Good B(2)
<b>Total density (number per m<sup>2</sup>square meter)</b>	<i>Threshold:</i>	<b>500</b>	<b>400</b>	<b>300</b>
	<i>Indeterminate range:</i>	(450-<500)	(350-<400)	(250-<300)
<b>Total richness of all unique taxa</b>	<i>Threshold:</i>	<b>35</b>	<b>31</b>	<b>27</b>
	<i>Indeterminate range:</i>	(34-<35)	(30-<31)	(26-<27)
<b>Richness of Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa</b>	<i>Threshold:</i>	<b>21</b>	<b>19</b>	<b>16</b>
	<i>Indeterminate range:</i>	(20-<21)	(18-<19)	(15-<16)
<b>Ratio of EPT individuals to EPT plus Chironomidae individuals</b>	<i>Threshold:</i>	<b>0.65</b>	<b>0.55</b>	<b>0.45</b>
	<i>Indeterminate range:</i>	(0.63-<0.65)	(0.53-<0.55)	(0.43-<0.45)
<b>Percent model affinity of orders (PMA-O)</b>	<i>Threshold:</i>	<b>65</b>	<b>55</b>	<b>45</b>
	<i>Indeterminate range:</i>	(60-<65)	(50-<55)	(40-<45)
<b>Percent of individuals as Oligochaeta</b>	<i>Threshold:</i>	<b>2.0</b>	<b>5.0</b>	<b>12.0</b>
	<i>Indeterminate range:</i>	(≥2.0-3.0)	(≥5.0-6.5)	(≥12.0-14.5)
<b>Hilsenhoff Biotic Index value</b>	<i>Threshold:</i>	<b>3.00</b>	<b>3.50</b>	<b>4.50</b>
	<i>Indeterminate range:</i>	(≥3.00-3.30)	(≥3.50-3.65)	(≥4.50-4.65)
<b>Pinkham-Pearson Coefficient of similarity of functional groups (PPCS-F)</b>	<i>Threshold:</i>	<b>0.50</b>	<b>0.45</b>	<b>0.40</b>
	<i>Indeterminate range:</i>	(0.45-<0.50)	(0.40-<0.45)	(0.35-<0.40)

Table A- 2. Macroinvertebrate Metrics for Moderate-Medium High Gradient (MHG) Vermont stream macroinvertebrate communities.

MHG Metric		Biological Integrity		
		Excellent A(1)	Very Good B(1)	Good B(2)
<b>Total density (number per square meter)</b>	<i>Threshold:</i>	<b>500</b>	<b>400</b>	<b>300</b>
	<i>Indeterminate range:</i>	(450-<500)	(350-<400)	(250-<300)
<b>Total richness of all unique taxa</b>	<i>Threshold:</i>	<b>43</b>	<b>39</b>	<b>30</b>
	<i>Indeterminate range:</i>	(41-<43)	(37-<39)	(28-<30)
<b>Richness of Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa</b>	<i>Threshold:</i>	<b>24</b>	<b>22</b>	<b>18</b>
	<i>Indeterminate range:</i>	(22-<24)	(20-<22)	(16-<18)
<b>Ratio of EPT individuals to EPT plus Chironomidae individuals</b>	<i>Threshold:</i>	<b>0.65</b>	<b>0.55</b>	<b>0.45</b>
	<i>Indeterminate range:</i>	(0.63-<0.65)	(0.53-<0.55)	(0.43-<0.45)
<b>Percent model affinity of orders (PMA-O)</b>	<i>Threshold:</i>	<b>65</b>	<b>55</b>	<b>45</b>
	<i>Indeterminate range:</i>	(60-<65)	(50-<55)	(40-<45)
<b>Percent of individuals as Oligochaeta</b>	<i>Threshold:</i>	<b>2.0</b>	<b>5.0</b>	<b>12.0</b>
	<i>Indeterminate range:</i>	(≥2.0-3.0)	(≥5.0-6.5)	(≥12.0-14.5)
<b>Hilsenhoff Biotic Index value</b>	<i>Threshold:</i>	<b>3.50</b>	<b>4.00</b>	<b>5.00</b>
	<i>Indeterminate range:</i>	(≥3.50-3.80)	(≥4.00-4.15)	(≥5.00-5.15)
<b>Pinkham-Pearson coefficient of similarity of functional groups (PPCS-F)</b>	<i>Threshold:</i>	<b>0.50</b>	<b>0.45</b>	<b>0.40</b>
	<i>Indeterminate range:</i>	(0.45-<0.50)	(0.40-<0.45)	(0.35-<0.40)

Table A-3. ~~Macroinvertebrate metrics~~ Metrics for Warm Water Moderate Gradient (WWMG) Vermont streams macroinvertebrate communities.

WWMG Metric		Biological Integrity		
		Excellent A(1)	Very Good B(1)	Good B(2)
<b>Total density (number per square meter)</b>	<i>Threshold:</i>	<b>500</b>	<b>400</b>	<b>300</b>
	<i>Indeterminate range:</i>	(450-<500)	(350-<400)	(250-<300)
<b>Total richness of all unique taxa</b>	<i>Threshold:</i>	<b>40</b>	<b>35</b>	<b>30</b>
	<i>Indeterminate range:</i>	(38-<40)	(33-<35)	(28-<30)
<b>Richness of Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa</b>	<i>Threshold:</i>	<b>21</b>	<b>19</b>	<b>16</b>
	<i>Indeterminate range:</i>	(20-<21)	(18-<19)	(15-<16)
<b>Ratio of EPT individuals to EPT plus Chironomidae individuals</b>	<i>Threshold:</i>	<b>0.65</b>	<b>0.55</b>	<b>0.45</b>
	<i>Indeterminate range:</i>	(0.63-<0.65)	(0.53-<0.55)	(0.43-<0.45)
<b>Percent model affinity of orders (PMA-O)</b>	<i>Threshold:</i>	<b>65</b>	<b>55</b>	<b>45</b>
	<i>Indeterminate range:</i>	(60-<65)	(50-<55)	(40-<45)
<b>Percent of individuals as Oligochaeta</b>	<i>Threshold:</i>	<b>2.0</b>	<b>5.0</b>	<b>12.0</b>
	<i>Indeterminate range:</i>	(≥2.0-3.0)	(≥5.0-6.5)	(≥12.0-14.5)
<b>Hilsenhoff Biotic Index value</b>	<i>Threshold:</i>	<b>4.25</b>	<b>4.75</b>	<b>5.40</b>
	<i>Indeterminate range:</i>	(≥4.25-4.40)	(≥4.75-4.8090)	(≥5.40-5.65)
<b>Pinkham-Pearson coefficient of similarity of functional groups (PPCS-F)</b>	<i>Threshold:</i>	<b>0.50</b>	<b>0.45</b>	<b>0.40</b>
	<i>Indeterminate range:</i>	(0.45-<0.50)	(0.40-<0.45)	(0.35-<0.40)

### Low Gradient Macroinvertebrate IBIs

Two IBIs shall be used to assess the two macroinvertebrate community types in low gradient streams (Tables A-4 and A-5). The IBIs for Slow Low Gradient (SLG) or Hybrid Low Gradient (HLG) community types contain ten metrics, with each metric scored with a value from one to five. A value of one corresponds with Poor, indicating the most departure from natural condition. A value of five corresponds with Excellent, indicating the most similarity to the natural condition. Table A-6 shows ~~corresponding~~ IBI scores with corresponding levels of biological integrity and water classification.

An initial IBI score shall be calculated by summing all individual metric scores, which results in a range of 10-50. The final IBI score shall be determined by applying the following steps:

- (1) If the initial IBI score is less than 29, then score as shown in Table A-6.
- (2) If the score is equal to or more than 29, then proceed to (3) below.
- (3) If metric 1, or metrics 2 and 3, or any four metrics score a "1" or "2", then score community a 28 (Fair).
- (4) Determinations for any assessment level on Table A-6 may be adjusted upward or downward if it is documented by the biologist that the finding is not representative of the macroinvertebrate community.

Table A-4. Macroinvertebrate-IBI metrics for Hybrid Low Gradient (HLG) Vermont stream macroinvertebrate communities.

HLG Metric	Score				
	5	4	3	2	1
1. Total Density (number per sample)	≥ 500	400-≤500	300-≤400	200-≤300	< 200
2. Richness <sup>†</sup> of EOT (Ephemeroptera, Odonata, and Trichoptera) (EOT) taxa	≥ 15	13-≤14	11-12<13	7-≤10	< 7
3. Richness <sup>†</sup> of intolerant taxa, based on BCG (Biological Condition Gradient (BCG) attribute scores 1-3	≥ 14	11-≤13	9-≤10	5-≤8	< 5
4. Percent of individuals as intolerant COTE (Coleoptera, Odonata, Trichoptera, and Ephemeroptera (COTE), based on BCG scores 1-3	≥ 28	20-≤28	13-≤20	5-≤13	< 5
5. Ratio <sup>2</sup> -Ratio <sup>1</sup> of EOT individuals to EOT plus Chironomidae individuals	≥ 0.50	0.38-≤0.50	0.26-≤0.38	0.13-≤0.26	< 0.13
6. PMA-O (Percent model affinity of orders (PMA-O)	≥ 75	65-≤75	55-≤65	45-≤55	< 45
7. Percent of individuals as Amphipoda and Isopoda (excluding the genus <i>Hyallolella</i> )	0	>0-1	≥1-5	≥5-25	> 25
8. Hilsenhoff Biotic Index value	< 4.0	4.0-≤5.0	5.0-≤6.0	6.0-≤6.5	≥ 6.5
9. PPCS-F (Pinkham-Pearson coefficient of similarity of functional groups (PPCS-F)	≥ 0.57	0.49-≤0.57	0.41-≤0.49	0.36-≤0.41	< 0.36
10. Ratio of individuals as shredders to individuals as shredder and collector-filterers	≥ 0.50	0.35-≤0.50	0.20-≤0.35	0.10-≤0.20	< 0.10

<sup>†</sup>In samples where two replicates were processed, richness metrics may have decimal values. In this case, values would be rounded down to odd numbers and rounded up to even numbers.

<sup>2-1</sup>These metrics exclude individuals in the families Baetidae (Ephemeroptera) and Hydropsychidae (Trichoptera).

Table A-5. ~~Macroinvertebrate~~ IBI metrics for Slow Low Gradient (SLG) ~~Vermont streams~~ macroinvertebrate communities.

SLG Metric	Score				
	5	4	3	2	1
1. Total Density (number per sample)	≥ 500	400-≤500	300-≤400	200-≤300	< 200
2. Richness <sup>1</sup> of <del>EOT</del> (Ephemeroptera, Odonata, and Trichoptera ( <u>EOT</u> ) taxa	≥ 15	11-≤14 <sup>15</sup>	8-≤10 <sup>11</sup>	5-≤7 <sup>8</sup>	< 5
3. Richness <sup>1</sup> of intolerant taxa, based on <del>BCG</del> (Biological Condition Gradient ( <u>BCG</u> ) attribute scores 1-3	≥ 10	7-≤9 <sup>10</sup>	5-≤7 <sup>6</sup>	2-4 <sup>5</sup>	< 2
4. Percent of individuals as intolerant <del>COTE</del> (Coleoptera, Odonata, Trichoptera, and Ephemeroptera ( <u>COTE</u> ) based on BCG scores 1-3	≥ 20	14-≤20	9-≤14	3-≤8	< 3
5. Ratio <sup>2</sup> -Ratio <sup>1</sup> of EOT individuals to EOT plus Chironomidae individuals	≥ 0.50	0.36-≤0.50	0.23-≤0.35	0.11-≤0.22	< 0.11
6. <del>PMA-O</del> (Percent model affinity of orders ( <u>PMA-O</u> ))	≥ 65	57-≤65	50-≤57	40-≤50	< 40
7. Percent of individuals as Amphipoda and Isopoda (excluding the genus <i>Hyalalela</i> )	0	>0-1	≥1-5	≥6 <sup>5</sup> -25	> 25
8. Hilsenhoff Biotic Index value	< 5.5	5.5-≤6.0	6.1 <sup>0</sup> -≤6.5	6.6 <sup>5</sup> -≤7.0	≥ 7.0
9. <del>PPCS-F</del> (Pinkham-Pearson coefficient of similarity of functional groups ( <u>PPCS-F</u> ))	≥ 0.50	0.42-≤0.50	.34-≤0.41 <sup>40</sup>	0.29-0.35 <sup>34</sup>	< 0.29
10. <del>EOT<sup>2</sup>-EOT<sup>1</sup></del> Density (number per <u>m<sup>2</sup>square meter</u> )	≥ 500	351-≤500	200-≤350	100-≤20 <sup>40</sup>	< 100

<sup>1</sup>In samples where two replicates were processed, richness metrics may have decimal values. In this case, values would be rounded down to odd numbers and rounded up to even numbers.

<sup>2</sup> These metrics exclude individuals in the families Baetidae (Ephemeroptera) and Hydropsychidae (Trichoptera).

Table A-6. IBI Assessment Scale for low gradient streams.

Class Equivalent and Assessment	IBI Range
A(1) Excellent-Threshold: <i>Indeterminate range (Very Good/Excellent):</i>	46-50 (44-45)
B(1) Very Good-Threshold: <i>Indeterminate range (Good/Very Good):</i>	39-43 (37-38)
B(2) Good-Threshold: <i>Indeterminate range (Fair/Good):</i>	31-36 (29-30)

Fair:	21-28
<i>Indeterminate range (Poor/Fair):</i>	(19-20)
Poor:	10-18

### Fish Community Biocriteria

*Fish Community Indexes of Biotic Integrity (IBI)s.* The health or biological integrity of fish communities in wadeable-sized, hard bottomed Vermont streams shall be evaluated by one of two IBIs, the Cold Water IBI (CWIBI) or the Mixed Water IBI (MWIBI). These two IBIs measure the extent of departure of the fish community from the natural condition. The CWIBI is used to assess the biological integrity of cold water, hard bottom streams that support two to four native species. The CWIBI is comprised of six metrics, with each metric having a possible score of 1.5 (Poor) to 7.5 (Excellent). The MWIBI is used to assess the biological integrity of both warm water and cold water, hard bottom streams that support five or more native fish species. The MWIBI is comprised of nine metrics, which each have a possible score of 1 (Poor) to 5 (Excellent). In applying the two IBIs, each metric is scored and then summed to produce a final score. Final scores for both Vermont IBIs range from 9 (Poor) to 45 (Excellent). Assessment scores that are within 1-2 points of the next highest or next lowest rating may be placed into that next highest or lower level by the biologist. Extenuating factors that are considered in making these determinations may include metric values that show dramatically higher or lower values, the proportion of the community composed of nonnative fish species, and species dominance.

*Fish Community Sampling Methods.* ~~Both the CWIBI and MWIBI shall be used to assess data from wadeable streams. All fish are collected using one or more backpack electrofishers. A sample shall be taken of from a section of a water stream that is representative of the habitat present in the overall stream reach and shall be long enough to provide a reliable sample in which the sample is to be taken. The length of stream fished shall be great enough to provide a representative sub-sample of the overall stream reach.~~ The minimum section length to be fished in wadeable streams shall be 75 meters regardless of width and increases with mean section width (Table A-7). When mean river widths exceed 12 meters, sampled area shall be reduced to the area from both banks out to approximately 4-6 meters. An IBI shall be calculated from a single electrofishing run. Where density is a of particular concern, two or to three runs shall be conducted, and a population estimate shall be calculated; when second run catch density exceeds 50% of first run, a third run shall be performed. Individual fish captured during the electrofishing run shall be enumerated by species, and the count of deformities, fin erosion, and lesions or tumor anomalies shall be noted for each species.

Table A-7. Minimum section lengths for sampling fish communities in wadeable Vermont streams by stream-based on wetted width.

<u>Stream Mean Wetted Width (meters)</u>	<u>≤3.5 or less</u>	<u>&gt;3.5--≤5</u>	<u>&gt;5--≤8</u>	<u>&gt;8--≤12<sup>1</sup></u>	<u>≥12+<sup>1</sup></u>
Minimum Section Length Sampled (meters)	75	100	120	150	150-200

Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A



| <sup>1</sup> May include from banks out to 4-6 meters, shocked only.

**MWIBI**

Table A-8. The Vermont Mixed Water Index of Biotic Integrity. Metric Scoring procedure for Metric 1 is presented in Figures A-1 and A-2. See Table A-8-9 for additional scoring procedures for metrics 2, 3, 6, 7, and 9.

MWIBI Metric	Score				
	5	4	3	2	1
<b>1. Total number of native fish species</b>	Maximum Species Richness Line				
<b>2. Number and identity of native intolerant species</b> <i>statewide, except for &lt; 400 ft. elevation in Champlain drainage</i> <i>&lt; 400 ft. elevation in Champlain drainage</i>	>1	-	1	-	0
<b>3. Number and identity of native benthic insectivores</b>	>1	-	1	-	0
<b>4. Proportion of individuals as White Suckers and Creek Chubs</b>	<11%	11-<18	18-<26	26-33	>33
<b>5. Proportion of individuals as native and nonnative generalist feeders</b> <i>statewide except for &lt; 500 ft. elevation in Champlain drainage</i> <i>&lt; 500 ft. elevation in Champlain drainage</i>	<20%	20-<28	28-<36	36-45	>45
<b>6. Proportion of individuals as native water column and benthic insectivores</b> <i>statewide, except &lt; 500 feet elevation in Champlain drainage</i> <i>&lt; 500 feet elevation in Champlain drainage</i>	>65%	54-65	43-<54	31-<43	<31
<b>7. Proportion of individuals as native top carnivores</b> <i>cold water population (include nonnative salmonids)</i> <i>warm water population (if drainage at sample site is &lt;25km<sup>2</sup> then score 5)</i>	>15%	11-15	8-<11	5-<8	<5
<b>8. Proportion of sample with deformities, fin erosion, lesions or tumors</b>	<1%	1-<2	2-<3	3-4	>4
<b>9. Abundance<sup>1</sup> of nNative Sspecies (numbers#/100m<sup>2</sup>)</b> <i>&lt;500 ft. elevation in Champlain drainage</i> <i>All other sites statewide: site alkalinity &gt;9 mg/l</i> <i>site alkalinity &lt;9 mg/l</i>	>20	-	10-20	-	<10
	>10	-	7-10	-	<7
	>6	-	3-6	-	<3

<sup>1</sup> Nonnative trout are included in metric 9.

Figure A-1. The Maximum Species Richness Line (MSRL) shall be used for scoring the native species richness metric in the MWIBI for sample sites above 500 feet in elevation and all sites in the Connecticut River watershed. A metric score of 1-5 is achieved by the visual intersection of the site drainage area ( $\text{km}^2$ ) with the number of native species collected.

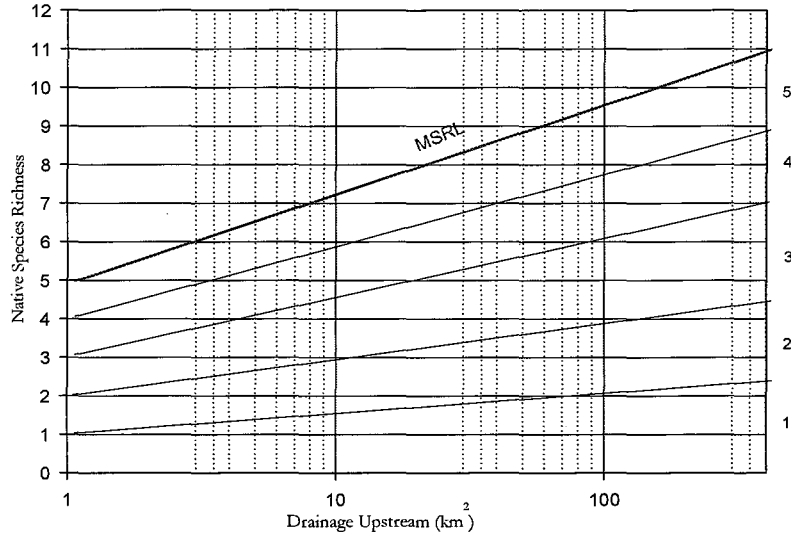


Figure A-2. This Maximum Species Richness Line (MSRL) shall be used for scoring the native species richness metric in the MWIBI for sample sites below 500 feet in the St. Lawrence River watershed. A metric score of 1-5 is achieved by the visual intersection of the site drainage area with the number of native species collected.

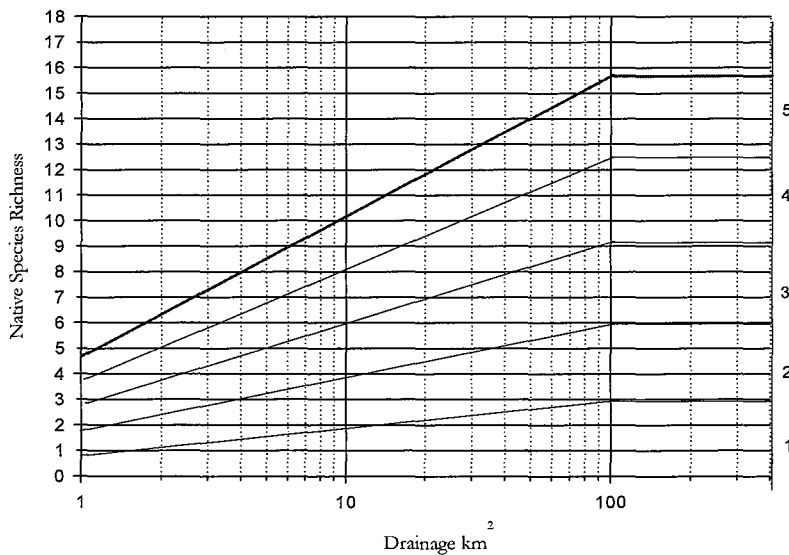


Table A-9. Scoring procedure for MWIBI metrics 2, 3, 6, 7, and 9.

Metric 2 (< 400 ft. elevation)	(1) If one species represented by two or more individuals OR two species represented by one fish each, then score <b>5</b> . (2) If one species represented by one individual, then score <b>3</b> . (3) If no species, then score <b>1</b> .
Metrics 2 (> 400 ft. elevation) and Metric 3	(1) If two or more species represented by two or more individuals each, then score <b>5</b> ; (2) If two species, one represented by two or more individuals and the other represented by one individual, then score <b>4</b> ; (3) If one species represented by two or more individuals OR two species represented by one fish each, then score <b>3</b> ; (4) If one species represented by one individual, then score <b>2</b> ; or (5) If no species, then score <b>1</b> .
Metric 6	If proportion of Blacknose Dace exceeds 55% of total sample or if the only insectivore, then score <b>1</b> .
Metric 7	A cold-water fish community is a community that naturally supports one or more of the following species: Brook Trout, Slimy Sculpin, Longnose Sucker, or Burbot.
Metric 9	If less than 20 individuals collected in sample, then score metrics 4-8 as <b>1</b> .

Table A-10. MWIBI Assessment Scale.

<u>Class Equivalent and Assessment</u>	<u>IBI Range</u>	<u>Score</u>	<u>Biological Integrity</u>	<u>Class Equivalent</u>
A(1) Excellent	41-45	41-45	Excellent	A(1)
B(1) Very Good	36-40	36-40	Very Good	B(1)
B(2) Good	30-35	30-35	Good	B(2)
Fair	27-29	27-29	Fair	Non-Support
Poor	<27	<27	Poor	Non-Support

## CWIBI

Table A-11. Cold Water Index of Biotic Integrity. Scoring rules for metrics 1, 2, 3, and ~~through~~ 4 shown in Table A-12. ~~Final index values rounded up for even values and down for odd values.~~

CWIBI Metric	Score				
	7.5	6	4.5	3	1.5
1. Number of <u>native</u> , intolerant species	2	-	1	-	0
2. Proportion of sample as cold water stenothermic species	> 75%	67-75	59-<67	50-<59	< 50
3. Proportion of individuals as generalist feeders	< 5%	5-7	>7-10	>10-13	> 13
4. Proportion of individuals as top carnivores	> 35%	32-35	29-<32	25-<29	< 25
5. <del>Brook trout</del> Trout density (numbers#/100 m <sup>2</sup> from <del>one</del> first electrofishing pass)	>4.0	-	2.0-4.0	-	<2.0
6. <del>Brook trout</del> Trout age class structure	YOY <sup>1</sup> and adults present	-	YOY only, no adults	-	YOY and adults absent

<sup>1</sup> Young of Year.

Table A-12. Metric scoring rules for CWIBI

For Metric 1	1) If two species represented by two or more individuals, then score <u>7.5</u> ; 2) If two species, one represented by two or more individuals and a second represented by one individual, then score <u>4.5</u> ; 3) If one species represented by two or more fish OR two species represented by one individual each, then score <u>3.5</u> ; 4) If species represented by one individual, then score <u>2.5</u> ; or 5) If no intolerant species, then score <u>1.5</u> .
For Metrics 2, 3, and 4	1) If less than 20 individuals in sample, then score <u>1.5</u> .

Table A-13. CWIBI Assessment Scale. ~~Total scores that fall in between whole numbers shall be rounded up for odd values and down for even values.~~

Score	Biological Integrity	Class Equivalent
<del>42</del> 41-45	Excellent	A(1)
36-40	Very Good	B(1)
30- <del>34</del> 35	Good	B(2)
27- <del>28</del> 29	Fair	Non-Support
<27	Poor	Non-Support

## Appendix H. OUTSTANDING RESOURCE WATERS

1. **Batten Kill**, Towns of East Dorset and Arlington. Designated June 12, 1991. The main stem of the Batten Kill from its headwaters in East Dorset and the West Branch to the New York border at Arlington, Vermont, a distance of approximately 26 miles. Designated on the basis of exceptional natural, recreational, cultural, and scenic values.
2. **Pike's Falls/Ball Mountain**, Town of Jamaica. Designated June 21, 1991. A portion of the North Branch between the point where Kidder Brook enters the brook above Pike's Falls to the point below the falls where an unnamed tributary, which originates from the Winhall Municipal Forest, enters the North Branch. This segment is approximately 4,000 feet in length and within this distance the stream descends 140 feet, much of the drop occurring within Pike's Falls. Designated on the basis of exceptional natural, recreational, and scenic values.
3. **Poultney River**, Towns of Poultney and Fair Haven. Designated June 28, 1991. The lower portion of the Poultney River beginning at the Poultney/Fair Haven town line and continuing downstream to its confluence with Lake Champlain. Designated on the basis of exceptional natural, cultural, and scenic values.
4. **Great Falls, Ompompanoosuc River**, Town of Thetford. Designated March 6, 1996. That portion of the Ompompanoosuc between its confluence with a tributary draining both Gillette Swamp and Mud Pond, also known as Forsyth Pond, and its confluence with the West Branch, 3.8 miles downstream in the Town of Thetford. Designated on the basis of exceptional recreational, cultural, scenic, and natural values.



THE UNIVERSITY OF  
THE STATE OF NEW YORK  
OFFICE OF THE STATE COMPTROLLER

STATE OF NEW YORK  
OFFICE OF THE STATE COMPTROLLER  
ALBANY, NEW YORK

STATE OF NEW YORK  
OFFICE OF THE STATE COMPTROLLER  
ALBANY, NEW YORK

STATE OF NEW YORK  
OFFICE OF THE STATE COMPTROLLER

STATE OF NEW YORK  
OFFICE OF THE STATE COMPTROLLER

STATE OF NEW YORK  
OFFICE OF THE STATE COMPTROLLER

Contents

Subchapter 1. APPLICABILITY, DEFINITIONS, AND POLICIES..... 4

- § 29A-101 Applicability ..... 4
- § 29A-102 Definitions ..... 4
- § 29A-103 General Policies ..... 9
- § 29A-104 Classification of Water Uses ..... 11
- § 29A-105 Antidegradation Policy ..... 11
- § 29A-106 Discharge Policy ..... 13
- § 29A-107 Interpretation..... 14

Subchapter 2. APPLICATION OF STANDARDS ..... 14

- § 29A-201 Sampling and Analysis ..... 14
- § 29A-202 Flow Values Used to Evaluate Compliance with Applicable Numeric Criteria for Rivers, Streams, Brooks, Creeks, and Riverine Impoundments ..... 15
- § 29A-203 Nonpoint Source Pollution ..... 16
- § 29A-204 Special Zones ..... 16
- § 29A-205 Public Water Source ..... 17
- § 29A-206 Water Quality Certifications Issued Pursuant to § 401 of the Clean Water Act ..... 18

Subchapter 3. WATER QUALITY CRITERIA ..... 19

- § 29A-301 Natural Influences..... 19
- § 29A-302 Criteria Applicable to Waters Based upon Fish Habitat Designation, Use Classification, or Type of Body of Water ..... 19
- § 29A-303 General Criteria Applicable to all Waters ..... 23
- § 29A-304 Hydrology Criteria..... 25
- § 29A-305 Numeric Biological Indices and Aquatic Habitat Assessments ..... 27
- § 29A-306 Use-specific Management Objectives and Criteria by Class..... 27



§ 29A-307 Classification of Waters.....	35
§ 29A-308 Fish Habitat Designation .....	35
Appendix A. FISH HABITAT DESIGNATION.....	35
§ A-01 Warm Water Fish Habitat.....	35
§ A-02 Cold Water Fish Habitat .....	41
Appendix B. DESCRIPTION OF LAKE CHAMPLAIN AND LAKE MEMPHREMAGOG SEGMENTS FOR APPLICATION OF PHOSPHORUS CRITERIA .....	42
Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA.....	44
Appendix D. CONVERSION FACTORS FOR ESTIMATING DISSOLVED METALS FROM TOTAL VALUES.....	65
Appendix E. PARAMETERS FOR CALCULATING FRESHWATER TOTAL METALS CRITERIA THAT ARE HARDNESS DEPENDENT.....	66
Appendix F. WATER QUALITY CLASSIFICATIONS.....	67
Appendix G. APPLICATION OF BIOCRITERIA FOR FISH AND MACROINVERTEBRATE COMMUNITIES IN VERMONT WADEABLE STREAMS AND RIVERS.....	100
Appendix H. OUTSTANDING RESOURCE WATERS .....	113

## Subchapter 1. APPLICABILITY, DEFINITIONS, AND POLICIES

### § 29A-101 Applicability

- (a) Pursuant to 10 V.S.A. Chapter 47, after the use classification of any water has been established, that water shall be managed by the Secretary in order to obtain and maintain the classification for that use. The Secretary may enforce a classification and these rules against any person affected thereby who, with notice of the classification, has failed to comply.
- (b) The applicable Water Quality Standards shall be those in effect at the time of final permit or certification issuance. Concerning Water Quality Certification for a License, or the renewal of a License, issued by the Federal Energy Regulatory Commission (FERC), the applicable Water Quality Standards shall be those in effect at the time that the FERC issues notice of application ready for environmental analysis for a License.
- (c) These rules shall apply to all “waters,” as defined in these rules, including “waters of the United States” as defined in titles 33 and 40 of the Code of Federal Regulations. These rules shall apply to wetlands as articulated in Sections §§ 29A-104(e) and 29A-105(e). Application of these rules to waters shall not require the issuance of a state or federal permit, license, certification, or approval for discharges or activities for which no such permit, license, certification, or approval requirement exists under applicable state or federal law, including discharges and activities that satisfy the exemptions and exclusions set forth at 40 C.F.R. §§ 122.3 and 232.3.
- (d) In the event any of these rules, or any portion thereof, is found by a court of competent jurisdiction to be illegal or void, the remainder thereof shall be deemed unaffected and shall continue in full force and effect.
- (e) The following exclusions apply only to artificial bodies of water that were not originally created in waters or did not result from impoundment of waters:
  - (1) Off stream reservoirs (such as snowmaking ponds) may be subject to water level fluctuations that are necessary to achieve the purposes for which the reservoir was constructed and accordingly, shall not be required to meet the criteria of these rules impacted by water level fluctuations in the reservoir;
  - (2) Waste treatment systems (including waste management systems constructed as part of Best Management Practices under 6 V.S.A. Chapter 215 and treatment ponds, lagoons, or wetlands created solely to meet the requirements of a permit issued for a discharge) determined to be necessary to achieve compliance with these rules shall not be required to be managed as waters under these rules.
- (f) Waters created exclusively by rainfall or snowmelt events, such as puddles and overland flow, that are so temporary in nature that they do not support the existing and designated uses, shall not be considered waters.

## § 29A-102 Definitions

For the purposes of these Water Quality Standards, the terms below shall have the following meanings unless a different meaning clearly appears from the context.

- (1) "Act" means the "Vermont Water Pollution Control Act" at 10 V.S.A. Chapter 47.
- (2) "Applicable water quality criteria" means all criteria specified in Subchapter 3 that are applicable to a water and the classification of its uses.
- (3) "Application" means any request for a permit required by state or federal law when filed with, and deemed complete by, the reviewing authority.
- (4) "Aquatic biota" means all organisms that, as part of their natural life cycle, live in or on waters.
- (5) "Aquatic habitat" means the physical, chemical, and biological components of the water environment.
- (6) "Assimilative capacity" means a measure of the capacity of the receiving waters to assimilate wastes without lowering their quality below the applicable water quality criteria.
- (7) "Best management practices (BMPs)" means a practice or combination of practices that may be necessary, in addition to any applicable RAPs or AMPs, to prevent or reduce pollution from nonpoint source wastes to a level consistent with the applicable provisions of these rules.
- (8) "Biological integrity" means the ability of a body of water to support and maintain a community of organisms that has the expected species composition, diversity, and functional organization comparable to that of the water in its natural condition.
- (9) "Classification" means the water quality classification attributed to a designated use for a body of water in accordance with the provisions of 10 V.S.A. §§ 1252 and 1253.
- (10) "Designated use" means any value or use, whether presently occurring or not, for which a water has been designated as Class A(1), A(2), B(1), or B(2).
- (11) "Discharge" means the placing, depositing, or emissions of any wastes, directly or indirectly, into an injection well or into waters.
- (12) "EPA or USEPA" means the U.S. Environmental Protection Agency.
- (13) "Equilibrium condition" means the condition in which water flow, sediment, and woody debris are transported in a watershed in such a manner that the stream maintains its dimension, pattern, and profile without unnaturally aggrading or degrading the channel bed elevation at the stream reach scale.
- (14) "Existing discharge" means any discharge to the extent authorized by a valid permit issued under the provisions of 10 V.S.A. §§ 1263 or 1265 as of January 7, 1985.
- (15) "Existing use" means a use that has actually occurred on or after November 28, 1975, in or on waters, regardless of whether or not the use is presently occurring or included in these rules.

- (16) "Flow characteristics" means the depth, volume, velocity, and variation of streamflow that, in part, determine stream processes, physical habitat structure, and aquatic habitat quality in channels and floodplains as governed by factors associated with valley setting, geology, and climate.
- (17) "Full support of uses" means the achievement of the level of water quality necessary to consistently maintain and protect existing and designated uses and the achievement of management objectives consistent with the classification level for designated uses.
- (18) "Functional component" means a portion of the aquatic biological community identified by its role in the processing of energy within the aquatic ecosystem (e.g., primary producers, detritivores, benthic insectivores and predators, etc.).
- (19) "Groundwater" means water below the land surface.
- (20) "Indirect discharge" means any discharge to groundwater, whether subsurface, land-based, or otherwise.
- (21) "Intolerant aquatic organisms" means those organisms that are particularly sensitive to, and likely to be adversely affected by, the stress of pollution, flow modification, or habitat alteration (e.g., mayflies, stoneflies, and Brook Trout).
- (22) "Low median monthly flow" means the median monthly flow for that month having the lowest median monthly flow.
- (23) "Mean daily flow" means the arithmetic mean of the sum of individual flow values measured over a calendar day that is representative of the total flow over that 24-hour period.
- (24) "Median monthly flow" means, for a given calendar month, the mean daily flow that is equaled or exceeded 50 percent of the time, based on a long-term record.
- (25) "Median annual flow" means that mean daily flow that is equaled or exceeded 50 percent of the time.
- (26) "Mixing zone" means a length or area within waters required for the dispersion and dilution of waste discharges adequately treated to meet federal and state treatment requirements and within which it is recognized that specific water uses or water quality criteria associated with the assigned classification for such waters may not be realized. A mixing zone shall not extend more than 200 feet from the point of discharge. A mixing zone shall not be used to meet water quality criteria for bioaccumulative toxins.
- (27) "Natural condition" means the range of chemical, physical, and biological characteristics of a body of water that occur with only minimal effects from human influences.
- (28) "Natural flow regime" means a water's characteristic pattern of variability in flow rates and water levels, annually, seasonally, and daily, without the influence of artificial flow regulation. This pattern of variability is characterized by the magnitude, frequency, duration, timing, and rate of change of hydrologic conditions.
- (29) "New discharge" means any discharge not authorized under the provisions of 10 V.S.A. § 1263 as of January 7, 1985 or any increased pollutant loading or demand on the assimilative capacity of the receiving waters from an existing discharge that requires the issuance of a new or amended permit.

- (30) “Nonpoint source waste” or “nonpoint source pollution” means waste that reaches waters in a diffuse manner from any source other than a point source including overland runoff from construction sites, or as a result of agricultural or silvicultural practices.
- (31) “Nonpolluting waste” means waste that prior to treatment does not have the potential to impair the condition of waters.
- (32) “Permit” means a certification, dam order, or other authorization in which during the application review process, compliance with the Vermont Water Quality Standards is evaluated pursuant to applicable state or federal law.
- (33) “Physical habitat structure” means the diverse combination and complexity of instream forms created within substrate and woody debris on and within the bed and banks of the channel by stream processes and flow characteristics, as well as the portion of the riparian area that supports woody debris recruitment and temperature refuge. Physical habitat structure, in part, determines aquatic habitat quality at the stream reach and stream network scales by providing for all life cycle functions, which include the full set of forms necessary for the provision of and access to cover, overwintering, and temperature refuge and the substrates necessary for feeding and reproduction of aquatic biota and wildlife.
- (34) “Point source” means any discernable, confined, and discrete conveyance, including any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft, from which either a pollutant or waste is or may be discharged.
- (35) “Public interest” means that which shall be for the greatest benefit to the people of the State as determined by the Secretary, in accordance with the criteria set forth 10 V.S.A. § 1253(c).
- (36) “Receiving waters” means all waters adjacent to a discharge, and all downstream or other waters the quality of which may be affected by that discharge.
- (37) “Reference water body” means a water that represents the natural condition for a specific water body type against which the condition of waters of similar water body type are evaluated.
- (38) “Required agricultural practices (RAPs) or acceptable management practices for maintaining water quality on logging jobs (AMPs)” means those land management practices adopted by the Secretary of Agriculture, Food and Markets, and Commissioner of Forests, Parks and Recreation, respectively, in accordance with applicable state law.
- (39) “Riparian areas” means the zones of interaction and influence between aquatic and terrestrial ecosystems along streams, rivers, lakes, wetlands, and other bodies of water.
- (40) “Riverine impoundment” means a reach of river or stream subject to the backwater influence of a human-made dam with the water remaining generally within the natural channel.
- (41) “Seven day low flow, ten year return period (7Q10)” means a flow equal to the lowest mean flow for seven consecutive days, adjusted to nullify any effects of artificial flow regulation, that has a 10% chance of occurring in any given year.
- (42) “Secretary” means the Secretary of the Agency of Natural Resources or the Secretary’s duly authorized representative.

- (43) “Stream processes” means the hydrologic, bed-load sediment, and large woody debris regimes of a particular stream reach and is a term used to describe stream channel hydraulics, or the erosion, deposition, sorting, and distribution of instream materials by the power of flowing water. Stream processes work toward an equilibrium condition; are governed by flow characteristics, stream morphology, channel roughness, floodplain connectivity, and the riparian area, which supports woody debris recruitment and temperature refuge; and, in part, determine physical habitat structure and aquatic habitat quality.
- (44) “Tactical basin plan” means a plan prepared by the Secretary for each of Vermont’s 15 basins in conjunction with the basin planning process required by 40 C.F.R. Part 130, 10 V.S.A. Chapter 47, and these rules.
- (45) “Taxonomic component” means a portion of the biological community identified by a hierarchical classification system for identifying biological organisms that uses physical and biological characteristics (e.g., Insecta: Plecoptera: Perlidae: Agnetina capitata).
- (46) “Thirty day low flow, ten year return period (30Q10)” means a flow equal to the lowest mean flow for 30 consecutive days, adjusted to nullify any effects of artificial flow regulation, that has a 10% chance of occurring in any given year.
- (47) “Tolerant aquatic organisms” means organisms (e.g., rattail maggots, annelids, Creek Chubs) that, although they may be affected by the stress of pollution, flow modification or habitat alteration, are less sensitive and less likely to be adversely affected than are intolerant aquatic organisms.
- (48) “Toxic substances” means those wastes and combinations of wastes that, after discharge and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of available information cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological or reproductive malfunctions, or physical deformations in such organisms or their offspring.
- (49) “Waste” means effluent, sewage, or any substance or material, liquid, gaseous, solid or radioactive, including heated liquids, whether or not harmful or deleterious to waters; provided however, the term “sewage” as used in 10 V.S.A. Chapter 47 shall not include the rinse or process water from a cheese manufacturing process.
- (50) “Waste management zone” means a specific reach of Class B(1) or B(2) waters designated by a permit to accept the discharge of properly treated wastes that prior to treatment contained organisms pathogenic to human beings. Throughout the receiving waters, water quality criteria must be achieved, but increased health risks exist in a waste management zone due to the authorized discharge.
- (51) “Waters” include all rivers, streams, creeks, brooks, reservoirs, ponds, lakes, springs and all bodies of surface waters, artificial or natural, which are contained within, flow through, or border upon the State or any portion of it.
- (52) “Watershed” means a region containing waters that drain into a particular brook, stream, river, or other body of water.

- (53) "Wetland" means those areas of the state that are inundated by surface or groundwater with a frequency sufficient to support significant vegetation or aquatic life that depend on saturated or seasonally saturated soil conditions for growth and reproduction. Such areas include marshes, swamps, sloughs, potholes, fens, river and lake overflows, mud flats, bogs, and ponds, but excluding such areas as grow food or crops in connection with farming activities (10 V.S.A. § 902(5)).

#### § 29A-103 General Policies

- (a) These rules are intended to achieve the goals of the State's Water Quality Policy (10 V.S.A. § 1250), set forth below, as well as the objective of the federal Clean Water Act (33 U.S.C. § 1251 et seq.) which is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.
- (b) Water Quality Policy. It is the policy of the State of Vermont to:
- (1) protect and enhance the quality, character, and usefulness of its surface waters and to assure the public health;
  - (2) maintain the purity of drinking water;
  - (3) control the discharge of wastes to waters, prevent degradation of high quality waters, and prevent, abate, or control all activities harmful to water quality;
  - (4) assure the maintenance of water quality necessary to sustain existing aquatic communities;
  - (5) provide clear, consistent, and enforceable standards for the permitting and management of discharges;
  - (6) protect from risk and preserve in their natural state certain high quality waters including fragile high-altitude waters, and the ecosystems they sustain;
  - (7) manage waters to promote a healthy and prosperous agricultural community, to increase the opportunities for use of the State's forest, parks, and recreational facilities, and to allow beneficial and environmentally sound development; and
  - (8) seek over the long term to upgrade the quality of waters and to reduce existing risks to water quality.
- (c) Water Conservation Policy. Water is a natural resource that should be managed efficiently to reduce waste through promotion of water conservation. It shall be the policy of the State to conserve the water resources of Vermont through technology, methods, and procedures designed to promote efficient use of water; to consider water conservation in all water use decisions; and to reduce or minimize the waste of water through water supply management practices.
- (d) Riparian Policy. The State of Vermont recognizes the importance of conserving riparian areas adjacent to surface waters for their important physical, hydrological, and ecological functions, including water temperature moderation; sediment and nutrient filtration and

retention; large wood and organic material recruitment and retention; streambank, shoreland, and floodplain stability; and the provision of habitat and travelways for a wide variety of species.

(e) Tactical Basin Planning.

- (1) Pursuant to 10 V.S.A. § 1253, the Secretary is required to adopt tactical basin plans. Such plans inventory the existing and potential causes and sources of pollution that may impair the waters. Tactical basin plans establish a strategy to improve or restore waters, and to ensure full support of uses. Tactical basin plans serve as the guide, consistent with applicable state and federal law, for how various sources of pollution within each basin will be managed in order to achieve compliance with these rules. The Secretary is required by state law to revise all 15 tactical basin plans on a five-year rotating basis.
- (2) As part of the tactical basin planning process, public participation shall be sought to identify and inventory problems, solutions, high quality waters, existing uses and the quality of such uses, and significant resources of high public interest.
- (3) In preparing tactical basin plans, the Secretary shall, to the extent required by applicable law, consider all relevant aspects of approved municipal plans and regional plans adopted under 24 V.S.A. Chapter 117 and coordinate and cooperate with the Secretary of the Agency of Agriculture, Food and Markets as provided for in 6 V.S.A. Chapter 215.
- (4) Each tactical basin plan shall identify strategies, where necessary, by which to allocate levels of pollution between various sources as well as between individual discharges. Tactical basin plans shall, to the extent appropriate, contain specific recommendations by the Secretary that include the identification of all known existing uses, any recommended changes in classification and designation of waters, including reclassifying waters' uses from Class B(2) to a higher classification level and designating waters as Outstanding Resource Waters, schedules and funding for remediation, stormwater management, riparian zone management, and other measures or strategies pertaining to the enhancement and maintenance of the quality of waters within the basin.
- (5) Upon adoption of a tactical basin plan, the Secretary shall promptly initiate rulemaking and shall give due consideration to the recommendations contained in the tactical basin plan.

(f) Hydrology Policy.

- (1) The proper management of water resources now and for the future requires careful consideration of the interruption of the natural flow regime and the fluctuation of water levels resulting from the construction of new, and the operation of existing, dams, diversions, and other control structures. These rules, in conjunction with other applicable law, provide a means for determining conditions which preserve the natural flow regime of waters.



- (2) When determining necessary streamflows or conditions necessary to further the goals of this policy through application of the applicable procedures or regulations, the Secretary, as provided for in 10 V.S.A. § 1003, may cooperate with appropriate federal, state, municipal, and private interests to assure consistency with these rules.

#### § 29A-104 Classification of Water Uses

- (a) Uses for waters are classified separately. A body of water may be assigned different classifications for different uses. For each use, management objectives and associated criteria for those objectives are presented by classification level in § 29A-306 of these rules.
- (b) All waters of the State shall be managed to support their designated and existing uses. Existing classifications of water uses shall be maintained unless reclassified in a manner consistent with the Act and in compliance with all applicable federal requirements, including 40 C.F.R. § 131.10(g).
- (c) Recommendations for use reclassification shall be made during the tactical basin planning process or by the Department of Environmental Conservation on a case-by-case basis. Pursuant to 10 V.S.A. § 1253, on the Secretary's own motion, or on receipt of written request that the Secretary adopt, amend, or repeal a reclassification rule, the Secretary shall comply with 3 V.S.A. § 806 and may initiate a rulemaking proceeding to reclassify one or more uses of all or any portion of the affected waters in the public interest.
- (d) The designated uses are:
  - (1) Aquatic biota and wildlife that may utilize or are present in the waters;
  - (2) Aquatic habitat to support aquatic biota, wildlife, or plant life;
  - (3) The use of waters for the enjoyment of aesthetic conditions;
  - (4) The use of waters for boating and related recreational uses;
  - (5) The use of waters for fishing and related recreational uses;
  - (6) The use of waters for swimming and other primary contact recreation;
  - (7) The use of the water for public water source; and
  - (8) The use of water for irrigation of crops and other agricultural uses.
- (e) For all Class I and II wetlands, as defined in 10 V.S.A. § 902, the uses to be protected include the functions and values of the wetland as described in Section 5 of the Vermont Wetland Rules.

#### § 29A-105 Antidegradation Policy

- (a) General. All waters shall be managed in accordance with these rules to protect, maintain, and improve water quality.
- (b) Protection and Determination of Existing Uses.

Existing uses of waters and the level of water quality necessary to protect those existing uses shall be maintained and protected regardless of the water's classification. Determinations of what constitute existing uses of particular waters shall be made either during the basin planning process or on a case-by-case basis during consideration of an application. The use of waters to receive or transport discharges of waste shall not constitute an existing use for purposes of these rules. In determining the existing uses to be protected and maintained under this section and all other sections of these rules, the Secretary shall consider the designated uses, and at least the following factors:

- (1) Aquatic biota and wildlife that utilize or are present in the waters;
- (2) Habitat that supports or is capable of supporting aquatic biota, wildlife, or plant life;
- (3) The use of the waters for recreation or fishing;
- (4) The use of the water for public water source, or commercial activity that depends directly on the preservation of an existing high level of water quality; and
- (5) For factors (1) and (2) above, evidence of the use's ecological significance in the functioning of the ecosystem or evidence of the use's rarity.

(c) Protection and Maintenance of High Quality Waters.

- (1) Waters the existing quality of which exceeds any applicable water quality criteria provide important environmental, economic, social, and other benefits to the people of the State. Except as provided in subdivision (2) of this subsection, such waters shall be managed to maintain and protect the higher water quality and minimize risk to existing and designated uses. In all cases, the level of water quality necessary to maintain and protect all existing uses as well as applicable water quality criteria shall be maintained.
- (2) A limited reduction in the existing higher quality of such waters may be allowed only when it is shown that:
  - (A) through the applicable permitting or approval process, the Secretary has provided public notice of the draft decision and an opportunity for public comment on the decision;
  - (B) after an analysis of alternatives, allowing lower water quality is necessary to prevent substantial adverse economic or social impacts on the people of the State; and
  - (C) there shall be achieved the highest statutory and regulatory requirements for all new or existing point sources, and all cost effective and reasonable best management practices for nonpoint source control, consistent with state law.
- (3) The analysis of alternatives required under subdivision (c)(2)(B) of this subsection shall evaluate a range of alternatives that would prevent or lessen the degradation associated with the proposed activity. When the analysis identifies one or more practicable alternatives, the Secretary shall only find that a lowering is necessary if one such practicable alternative is selected for implementation. For purposes of this

section, “practicable” means technologically possible, able to be put into practice, and economically viable.

- (4) To the extent any reduction in the quality of high quality waters is allowed, such reduction shall be limited to that which complies with subdivision (c)(2) of this subsection.
- (d) Protection of Outstanding Resource Waters. The Secretary may under 10 V.S.A. § 1424a designate certain waters as Outstanding Resource Waters. Outstanding Resource Waters are listed in Appendix H of these rules. Where the Secretary so designates such waters for specific exceptional natural, recreational, cultural, or scenic values, their existing quality, associated with the values for which they have been designated, shall, at a minimum, be protected and maintained.
- (e) Protection of Wetlands. Wetlands and their functions and values shall be protected as described by the Vermont Wetland Rules.

#### § 29A-106 Discharge Policy

- (a) Discharge Criteria. In addition to the other provisions of these rules, new discharges of wastes may be allowed only when all the following criteria are met:
  - (1) The proposed discharge is in conformance with all applicable provisions of these rules including the classification of the receiving waters adopted by the Secretary as set forth in Appendix F of these rules.
  - (2) There is neither an alternative method of waste disposal, nor an alternative location for waste disposal, that would have a lesser impact on water quality including the quality of groundwater, or if there is such an alternative method or location, it would be clearly unreasonable to require its use.
  - (3) The design and operation of any waste treatment or disposal facility is adequate and sufficiently reliable to ensure the full support of uses and to ensure compliance with these rules and with all applicable state and federal treatment requirements and effluent limitations.
  - (4) Except as provided for in 10 V.S.A. § 1259(d) and (f), the discharge of wastes other than nonpolluting wastes and stormwater runoff is prohibited in Class A(1) and A(2) waters regardless of the degree of treatment provided.
  - (5) Except as provided for in 10 V.S.A. § 1259, the discharge of wastes that, prior to treatment, contained organisms pathogenic to human beings into waters is prohibited.
  - (6) The receiving waters will have sufficient assimilative capacity to accommodate the proposed discharge.
  - (7) Assimilative capacity has been allocated to the proposed discharge consistent with the classification set forth in Appendix F of these rules.

- (8) The discharge of wastes to the thermocline or hypolimnion of any lake in manner that may prevent the full support of uses is prohibited.
- (9) The discharge of sewage into Class B(1) or B(2) waters shall not pose more than a negligible risk to public health. Compliance with this criterion shall include an assessment of both the level and reliability of treatment achieved and the impact of the discharge on the water quality of the receiving waters.
- (b) Assimilative Capacity. The capacity of waters to assimilate both the discharge of wastes and the impact of other activities that may adversely affect water quality, and at the same time to be maintained at a level of water quality that is compatible with their classification, is finite. The Secretary may hold a portion of the assimilative capacity in reserve to provide for future needs, including the abatement of future sources of pollution and future social and economic development. Accordingly, the assimilative capacity of waters shall be carefully allocated in accordance with the "Wasteload Allocation Process" as adopted by the Secretary.
- (c) Compliance Schedules. A permit issued pursuant to Vermont's federally delegated National Pollutant Discharge Elimination System (NPDES) program may, when appropriate, specify a schedule leading to compliance with the Vermont and Federal Clean Water Acts and regulations. The purpose of a schedule of compliance generally is to afford a permittee adequate time to comply with one or more permit requirements or limitations that are based on new, newly interpreted or revised water quality standards that became effective after both issuance of the initial permit for a discharge and July 1, 1977. For a permit requirement or limitation that is based on such a new, newly interpreted, or revised water quality standard, the Secretary may include a schedule of compliance in a permit at the time of permit reissuance or modification where the permittee either cannot comply with the permit requirement or limitation, or there is insufficient information available to determine whether the permittee can comply with the permit requirement or limitation. A schedule of compliance shall require compliance at the earliest possible time, as determined by the Secretary. A schedule of compliance shall include dates for specified tasks or activities leading to compliance and may include interim effluent limitations, as the Secretary deems appropriate. This provision does not limit the Secretary's authority to include compliance schedules in permits as provided by state law.

#### § 29A-107 Interpretation

The Secretary may issue declaratory rulings regarding the water quality standards pursuant to 10 V.S.A. § 1252(f).

### Subchapter 2. APPLICATION OF STANDARDS

#### § 29A-201 Sampling and Analysis

All numeric water quality criteria shall be applied by rounding to the nearest significant number in accordance with standard mathematic practice. For the purposes of these rules, sample collection, preservation, handling and analysis shall conform as closely as practicable

to methods established in the most current edition or publication of any of the following sources:

- (1) "Standard Methods for the Examination of Water and Wastewaters," Public Health Association, New York.
- (2) "American Society for Testing and Materials," part 23, "Water; Atmospheric Analysis," American Society for Testing and Materials.
- (3) "Methods for Chemical Analysis of Water and Wastes," U.S. Environmental Protection Agency.
- (4) "Microbiological Methods for Monitoring the Environment - Water and Wastes," U.S. Environmental Protection Agency.
- (5) The "Quality Assurance Program and Project Plan" prepared by the Secretary and as approved by EPA.
- (6) Any applicable practice or procedure adopted by the Secretary under the provisions of 3 V.S.A. § 835 or any rule adopted as part of the "Vermont Water Pollution Control Permit Regulations" under the provisions of 3 V.S.A. § 836.
- (7) Any applicable practices or procedures adopted by the Secretary for conducting nonpoint source pollution monitoring. Such procedures shall be adopted after public notice and comment. Until such procedures are adopted, nonpoint source pollution monitoring shall be conducted in accordance with generally accepted scientific monitoring or evaluation methodologies which the Secretary determines to be appropriate.

#### § 29A-202 Flow Values Used to Evaluate Compliance with Applicable Numeric Criteria for Rivers, Streams, Brooks, Creeks, and Riverine Impoundments

- (a) Natural Flow Regime. Where the natural flow regime is not altered or substantially influenced by any human-made structure or device, compliance with the applicable numeric water quality criteria shall be calculated on the basis of the 7Q10 flow value unless an alternate flow statistic is specified in Section 3-01 of these rules. This rule shall not be construed to allow less than normal design operation of any treatment facility during periods of low streamflow or to otherwise waive the terms of any permit.
- (b) Natural Flow Regime Altered by Human-made Structures.
  - (1) Where there is a Minimum Flow Agreement or requirement. For waters where the natural flow regime is altered by a human-made structure and where a minimum flow agreement or requirement has been established under 10 V.S.A. § 1003 or pursuant to a Section 401 Water Quality Certification, issued pursuant to the "Vermont Water Pollution Control Permit Regulations", compliance with the applicable numeric water quality criteria shall be calculated on the basis of the 7Q10 flow value or at the agreed/required minimum flow, whichever is less, unless an alternative flow statistic is specified in § 29A-304 of these rules.
  - (2) Where there is no Minimum Flow Agreement or requirement. For waters where the natural flow regime is altered by human-made structures and where no minimum flow

agreement or requirement has been established, compliance with the applicable numeric water quality criteria shall be calculated on the basis of the 7Q10 flow value or at the absolute low flow resulting from flow regulation, whichever is less, unless an alternative flow statistic is specified in § 29A-304 of these rules.

#### § 29A-203 Nonpoint Source Pollution

##### (a) Policy.

- (1) The State of Vermont recognizes that certain wastes from nonpoint sources, including nonpoint source waste from agricultural or silvicultural activities, are of such a nature that strategies required by the Act or by 6 V.S.A. Chapter 215, and those strategies developed in the tactical basin planning process, represent a practicable basis for achieving compliance with these rules.
- (2) In implementing subdivision (a)(1) of this subsection, the Secretary and the Secretary of the Agency of Agriculture, Food and Markets are encouraged to exercise the full range of discretion authorized by the Act and 6 V.S.A. Chapter 215 and to manage discharges of nonpoint source waste in a practical and cost-effective manner, consistent with the provisions of these rules.

##### (b) Use of Management Practices and Planning.

- (1) The requirements of these rules for any activity causing a nonpoint source discharge shall be presumed to be satisfied when the activity is in compliance with the RAPs, if applicable; is in compliance with the AMPs, if applicable; or is in compliance with BMPs required by statute, rule, permit, order, or other legally enforceable mechanism.
- (2) Any presumption provided by this section shall be negated when a water quality analysis conducted according to § 29A-201(7) of these rules demonstrates that there is a violation of these rules.

#### § 29A-204 Special Zones

##### (a) Mixing Zones.

- (1) Designation. Mixing zones shall not be created in any Class A(1) or A(2) water. In Class B(1) and B(2) waters the Secretary may, in conjunction with the issuance of a permit, designate a specific portion of the receiving waters not exceeding 200 feet from the point of discharge as a mixing zone for any waste that has been properly treated to comply with all applicable state and federal treatment requirements and effluent limitations. Within any mixing zone the Secretary may, in accordance with the terms of a permit, waive specific provisions of §§ 29A-105, 302, 303, and 306 of these rules when consistent with the criteria in subdivision (2) of this subsection, provided that the quality of the waters outside of the mixing zone complies with all applicable provisions of these rules.
- (2) Mixing Zone Criteria. The Secretary shall ensure that conditions due to discharges of waste within any mixing zone shall:

- (A) Not result in a significant increase in public health risk when evaluated using reasonable assumptions about exposure pathways;
- (B) Not constitute a barrier to the passage or movement of fish or prevent the full support of aquatic biota, wildlife, and aquatic habitat uses in the receiving waters outside the mixing zone;
- (C) Not kill organisms passing through the mixing zone;
- (D) Protect and maintain the existing uses of the waters;
- (E) Be free from materials in concentrations that settle to form objectionable deposits;
- (F) Be free from floating debris, oil, scum, and other material in concentrations that form nuisances;
- (G) Be free from substances in concentrations that produce objectionable color, odor, taste, or turbidity; and
- (H) Be free from substances in concentrations that produce undesirable aquatic life or result in a dominance of nuisance species.

(b) Waste Management Zones.

- (1) Designation. The designation of waste management zones is provided for in 10 V.S.A. § 1252(b)-(d). In Class B(1) and B(2) waters the Secretary may, in conjunction with the issuance of a permit for the direct discharge of properly treated wastes that prior to treatment contained organisms pathogenic to human beings, designate a specific portion of the receiving waters as a waste management zone when the criteria in subdivision (2) of this subsection are met. Waste management zones shall not be created in any Class A(1) or A(2) water. Within such zones, all water quality criteria shall be met.
- (2) Waste Management Zone Criteria. The Secretary shall ensure that, in addition to complying with all other applicable provisions of the statute and these rules, any waste management zone meets the following criteria:
  - (A) It shall be the minimum length necessary to accommodate the authorized discharge;
  - (B) It shall be consistent with the Antidegradation Policy, § 29A-105 of these rules;
  - (C) It shall not result in significantly increased health risks when evaluated using reasonable assumptions about exposure pathways;
  - (D) It will be located and managed so as to not result in more than a negligible increased risk to public health adjacent to or downstream of the waste management zone; and
  - (E) It will not constitute a barrier to the passage or movement of fish or prevent the full support of aquatic biota, wildlife, and aquatic habitat uses.

§ 29A-205 Public Water Source

- (a) Designation. In accordance with 10 V.S.A. § 1252, waters that are managed for the purpose of public water sources may be designated in Appendix F as Class A(2) Public Water Sources.
- (b) Public Water Source Management. In accordance with 10 V.S.A. § 1250, it is the policy of the State of Vermont that public water sources shall be managed in a manner that assures compliance with these rules. The Secretary is encouraged to exercise the full range of discretion consistent with 10 V.S.A. Chapters 47 and 56 to manage public water sources to achieve such compliance.

§ 29A-206 Water Quality Certifications Issued Pursuant to § 401 of the Clean Water Act

- (a) Section 401 of the CWA requires that for any federally licensed or permitted activity that may result in a discharge into waters of the United States, the State issue, waive, or deny water quality certification ensuring the discharge will comply with all applicable water quality requirements (33 U.S.C. § 1341).
- (b) A water quality certification shall not be issued unless the applicant demonstrates all of the following:
  - (1) There is no practicable alternative to the proposed activity that would have a less adverse impact on waters and wetlands of the State, and provided that any proposed alternative shall not have other significant adverse human health, safety, or environmental consequences. An alternative is considered practicable if it is available and capable of being completed after taking into consideration cost, existing technology, and logistics in light of overall purposes of the proposed activity.
    - (A) Projects that are not likely to have significant impacts on water quality or wetland functions or values; railroad projects; or State or municipal road or highway projects do not require an analysis of practicable alternatives.
    - (B) Failure to comply with the requirements of this section shall not be the basis for denial of an application for a certification under Section 401 of the Clean Water Act if the proposed activity is exempt from those requirements under a rule adopted by the Secretary.
  - (2) There is reasonable assurance that the discharge will not result in a violation of these rules, including any applicable water quality criteria and the Anti-degradation policy articulated in these rules.
    - (1) (c) Any certification issued by the State shall establish conditions necessary to ensure that the federally licensed or permitted activity will comply with these rules, as well as with any other appropriate requirement of state law, including: 10 V.S.A. chapter 37 (wetlands protection and water resources management);
    - (2) 10 V.S.A. chapter 41 (regulation of stream flow);
    - (3) 10 V.S.A. § 1264 (stormwater management);
    - (4) 29 V.S.A. chapter 11 (management of lakes and ponds); and
    - (5) The Agency of Natural Resources Rules for Water Withdrawals for Snowmaking.
- (d) The Secretary may issue a certification required by this subsection to any general permit or authorization issued by a federal agency. An applicant's compliance with that federal



permit or authorization shall be presumed to be in compliance with the certification unless the Secretary determines that an individual review of the applicant's activity is necessary to assure compliance with the Vermont Water Quality Standards and other appropriate State laws.(e) Public noticing of § 401 Water Quality Certification application, draft decision, and final decision.

- (1) The applicant shall provide notice of their § 401 Water Quality Certification application to any person or adjoining property owner that receives notice of the federal license or permit application for which the § 401 Water Quality Certification is sought. Adjoining property owners are those whose property adjoins the waterbody or aquatic site where the work is being proposed.
- (2) The Secretary shall provide notice of an administratively complete application through the environmental notice bulletin.
- (3) The Secretary shall provide notice of the draft decision through the environmental notice bulletin and shall post the draft decision to the bulletin.
- (4) The Secretary shall provide a public comment period of no less than 30 days. (5) Any person may request a public meeting on the draft decision issued under this section within 14 days of the issuance of the draft decision. The Secretary shall hold a public meeting whenever any person files a written request for such a meeting. The Secretary otherwise may hold a public meeting at his or her discretion.
- (6) The Secretary shall provide at least 14 days' notice of the public meeting through the environmental notice bulletin. If the notice of the public meeting is not issued at the same time as the draft decision or draft general permit, the Secretary also shall provide notice of the public meeting in the same manner as required for the draft decision or permit.
- (7) The Secretary shall provide notice of the final decision through the environmental notice bulletin and shall post the final decision or permit to the bulletin. When the Secretary issues the final decision, the Secretary shall provide a response to comments.

### Subchapter 3. WATER QUALITY CRITERIA

#### § 29A-301 Natural Influences

Waters in which one or more applicable water quality criteria are not met due to natural influences shall not be in noncompliance with respect to such criteria. In such waters, activities may be specifically authorized by a permit, provided that those activities do not further reduce the quality of the receiving waters and would comply with all other applicable criteria.

#### § 29A-302 Criteria Applicable to Waters Based upon Fish Habitat Designation, Use Classification, or Type of Body of Water

The following water quality criteria shall be achieved in waters, as specified below:

(1) Temperature.

- (A) General. The change or rate of change in temperature, either upward or downward, shall be controlled to ensure full support of aquatic biota, wildlife, and aquatic habitat uses. For the purpose of applying this criterion, ambient temperature shall mean the water temperature measured at a control point determined by the Secretary to be outside the influence of a discharge or activity.
- (B) Cold Water Fish Habitat. Waters that are cold water fish habitat shall meet the following standards, as applicable, except as provided for in subdivision (D) of this subsection.
  - (i) Class A(1) Waters for Fishing. No increase in ambient temperature from the natural condition.
  - (ii) Class B(1) Waters for Fishing.
    - (I) If the maximum temperature is below 68°F as a rolling seven-day mean of maximum daily water temperatures for the entire period from June 1 to September 30 of any year, the total increase from the ambient temperature due to all discharges and activities shall not exceed 1.0°F.
    - (II) If the maximum temperature is above 68°F as a rolling seven-day mean of maximum daily water temperatures for the entire period from June 1 to September 30 of any year, there shall be no increase in temperature due to all discharges and activities.
  - (iii) Class A(2) and B(2) Waters for Fishing. The total increase from the ambient temperature due to all discharges and activities shall not exceed 1.0°F.
- (C) Warm Water Fish Habitat. The total increase from the ambient temperature due to all discharges and activities shall not exceed the following temperature criteria, except as provided for in subdivision (D) of this subsection.
  - (i) Lakes, Ponds, and Reservoirs not including Riverine Impoundments.
    - (I) For waters with an ambient temperature above 60°F, the total temperature change shall not exceed 1°F.
    - (II) For waters with an ambient temperature between 60°F and 50°F, the total temperature change shall not exceed 2°F.
    - (III) For waters with an ambient temperature below 50°F, the total temperature change shall not exceed 3°F.
  - (ii) Rivers, Streams, Brooks, Creeks, and River Impoundments.
    - (I) For waters with an ambient temperature above 66°F, the total temperature change shall not exceed 1°F.

- (II) For waters with an ambient temperature between 63°F and 66°F, the total temperature change shall not exceed 2°F.
  - (III) For waters with an ambient temperature between 59°F and 62°F, the total temperature change shall not exceed 3°F.
  - (IV) For waters with an ambient temperature between 55°F and 58°F, the total temperature shall not exceed 4°F.
  - (V) For waters with an ambient temperature below 55°F, the total temperature change shall not exceed 5°F.
- (D) Assimilation of Thermal Wastes. The Secretary may, by permit condition, specify temperature limits that exceed the values specified above in order to authorize discharges of thermal wastes when it is shown that:
- (i) The discharge will comply with all other applicable provisions of these rules;
  - (ii) A mixing zone of 200 feet in length is not adequate to provide for assimilation of the thermal waste; and
  - (iii) After taking into account the interaction of thermal effects and other wastes, that change or rate of change in temperature will not result in thermal shock or prevent the full support of uses of the receiving waters.
- (2) Phosphorus.
- (A) In all waters, total phosphorus loadings shall be limited so that they will not contribute to the acceleration of eutrophication or the stimulation of the growth of aquatic biota in a manner that prevents the full support of uses.
  - (B) For lakes, ponds, or reservoirs that have drainage areas of less than 40 square miles and a drainage area to surface area ratio of less than 500:1, and their tributaries:
    - (i) In addition to compliance with subdivision (A) of this subsection, there shall be no significant increase over currently permitted phosphorus loadings. Discharges to tributaries shall not increase in-stream conditions by more than 0.001 mg/l at low median monthly flow. Indirect discharges to lakes, ponds, or reservoirs shall not increase total dissolved phosphorus as measured in the groundwater 100 feet from the mean water level of the lake, pond, or reservoir by more than 0.001 mg/l.
    - (ii) Applicable basin plans, other applicable plans, permit limitations, and other measures adopted or approved by the Secretary, may define “no significant increase” so as to allow new or increased discharges of phosphorus, only when the permit for such discharges provides for a corresponding reduction in phosphorus loadings to the receiving waters in question.
  - (C) For Lake Champlain and Lake Memphremagog. All discharges into each of the lake segments identified in Table 1, or into tributaries within the basin, shall comply with the applicable Total Maximum Daily Load (TMDL), tactical basin

plans, other applicable plans, permit limitations, and any other measures adopted or approved by the Secretary reasonably designed to achieve the criteria in Table 1.

Table 1. Phosphorus Criteria for Segments Within Lake Champlain and Lake Memphremagog.

Lake Segment (See Appendix B)		Phosphorus Criterion (mg/L as P) <sup>1</sup>
Lake Champlain		
	Main Lake	0.010
	Malletts Bay	0.010
	Burlington Bay	0.014
	Shelburne Bay	0.014
	Northeast Arm	0.014
	Isle LaMotte	0.014
	Otter Creek	0.014
	Port Henry	0.014
	St. Albans Bay	0.017
	Missisquoi Bay	0.025
	South Lake A	0.025
	South Lake B	0.054
Lake Memphremagog		
	Main Lake	0.014
	South Bay	0.025

1. These criteria shall be achieved as the annual mean total phosphorus concentration in the photosynthetic depth (euphotic) zone in central, open water areas of each lake segment.

(3) Nitrates.

(A) In all waters nitrates shall be limited so that they will not contribute to the acceleration of eutrophication, or the stimulation of the growth of aquatic biota, in a manner that prevents the full support of uses.

(B) For lakes, ponds, and reservoirs, not including riverine impoundments, levels of nitrate not to exceed 5.0 mg/l as NO<sub>3</sub>-N (nitrate-nitrogen) regardless of classification.

(C) For rivers and streams, levels of nitrate:

- (i) Not to exceed 0.20 mg/l, as NO<sub>3</sub>-N at flows exceeding low median monthly flows, in Class A(1) and A(2) waters above 2,500 feet altitude, National Geodetic Vertical Datum.
  - (ii) Not to exceed 2.0 mg/l as NO<sub>3</sub>-N at flows exceeding low median monthly flows, in Class A(1) and A(2) waters at or below 2,500 feet altitude, National Geodetic Vertical Datum.
  - (iii) Not to exceed 5.0 mg/l as NO<sub>3</sub>-N at flows exceeding low median monthly flows, in Class B(1) and B(2) waters.
- (4) Turbidity.
- (A) Class A(1) and A(2) Waters for Any Use or Cold Water Fish Habitat. Turbidity levels not to exceed 10 NTU (nephelometric turbidity units) as an annual average under dry weather base-flow conditions.
  - (B) All Other Waters. Turbidity levels not to exceed 25 NTU as an annual average under dry weather base-flow conditions.
- (5) Dissolved Oxygen. The dissolved oxygen criteria are instantaneous minimum values.
- (A) Cold Water Fish Habitat.
    - (i) In waters that the Secretary determines are salmonid spawning or nursery areas important to the establishment or maintenance of the fishery resource, not less than 7 mg/l and 75% saturation at all times, nor less than 95% saturation during late egg maturation and larval development of salmonids.
    - (ii) All Other Waters. Not less than 6 mg/l and 70% saturation at all times.
  - (B) Warm Water Fish Habitat. Not less than 5 mg/l and 60% saturation at all times.

§ 29A-303 General Criteria Applicable to all Waters

The following water quality criteria shall be achieved in all waters, regardless of their classification:

- (1) Sludge deposits or solid refuse. None.
- (2) Settleable solids, floating solids, oil, grease, scum, or total suspended solids. None in such concentrations or combinations that would prevent the full support of uses.
- (3) Taste and Odor. None that would prevent the full support of uses or have an adverse effect on the taste or odor of fish.
- (4) Color. No change from the natural condition that would prevent the full support of uses.
- (5) Alkalinity. No change from the natural condition that would prevent the full support of uses.

- (6) pH. pH values shall be maintained within the range of 6.5 and 8.5. Both the change and the rate of change in pH values shall be controlled to ensure the full support of uses.
- (7) Toxic substances.
- (A) General criteria. Waters shall be managed to prevent the discharge of toxic substances in concentrations, quantities, or combinations that exceed:
- (i) For toxic substances that are carcinogenic, a maximum individual lifetime risk to human health greater than  $10^{-6}$ ;
  - (ii) For toxic substances that are noncarcinogenic, a maximum individual lifetime risk of no adverse effect to human health; or
  - (iii) Acute or chronic toxicity to aquatic biota or wildlife.
- (B) Human health-based criteria.
- (i) In rivers, streams, brooks, creeks, and riverine impoundments, the human health based toxic pollutant criteria listed in Appendix C shall be applied at the median annual flow for toxic substances that are classified as known, probable, or possible human carcinogens or at the 7Q10 flow for toxic substances that are classified as threshold toxicants (not known or probable carcinogens).
  - (ii) In all other waters, the human health based toxic pollutant criteria listed in Appendix C shall apply at all times.
- (C) Aquatic biota-based criteria.
- (i) In rivers, streams, brooks, creeks, and riverine impoundments, the aquatic biota based toxic pollutants criteria that prevent acute or chronic toxicity listed in Appendix C shall be applied at 7Q10 flows. For chronic criteria that utilize 30-day average, 30Q10 flows shall apply. The 30Q10 flow is a biologically based design flow used to protect aquatic life from chronic effects. (ii) In all other waters, the aquatic biota based toxic pollutant criteria for acute or chronic toxicity listed in Appendix C shall apply at all times.
- (D) Other toxic substances.
- (i) Where numeric criteria for a toxic substance are not established by these rules, the Secretary may establish such criteria consistent with subsection (7) of this section, based on the procedures set forth in the Vermont Toxic Discharge Control Strategy (1994).
  - (ii) In establishing such limits, the Secretary shall give consideration to the potential for bio-accumulation as well as any antagonistic or synergistic relationship that may exist between the wastes being discharged and the concentration of other wastes or constituents in the receiving waters.
- (8) Radioactive Substances.

- (A) Waters shall be managed to prevent the discharge of radioactive substances in concentrations, quantities, or combinations that may create a significant likelihood of an adverse impact on human health or a risk of acute or chronic toxicity of aquatic biota or wildlife. Unless otherwise required by these rules, the Secretary shall determine limits for discharges containing radioactive substances based on the results of biological toxicity assessments and the appropriate available scientific data, including:
- (i) The Vermont State Health Regulation, Part 5, Chapter 3 “Radiological Health,” effective as of January 1, 2010.
  - (ii) 10 C.F.R. Part 50, Appendix I.
- (B) The discharge of radioactive substances shall not exceed the lowest limits which are reasonably achievable.

#### § 29A-304 Hydrology Criteria

- (a) General. To effectively implement the water conservation and hydrology policies set forth in § 29A-103 of these rules, and to ensure full support of uses, the following hydrology criteria shall be achieved and maintained, where applicable. Where there are multiple activities that affect flow in a watershed, a determination of compliance with the following criteria shall include consideration of the cumulative effects of these activities.
- (b) Streamflow Protection.
- (1) Class A(1) Waters for Aquatic Habitat. Changes from the natural flow regime shall not cause the natural flow regime to be diminished, in aggregate, by more than 5% of 7Q10 at any time;
  - (2) Class B(1) Waters for Aquatic Habitat. Changes from the natural flow regime, in aggregate, shall not result in natural flows being diminished by more than a minimal amount provided that all uses are fully supported; and when flows are equal to or less than 7Q10, by not more than 5% of 7Q10. The method for ensuring compliance with this subsection is a site-specific flow study or studies.
  - (3) Class A(2) and B(2) Waters for Aquatic Habitat or Recreation – Boating. Any change from the natural flow regime shall provide for maintenance of flow characteristics that ensure the full support of uses and comply with the applicable water quality criteria. The preferred method for ensuring compliance with this subsection is a site-specific flow study or studies. In the absence of site-specific studies, the Secretary may establish hydrologic standards and impose additional hydrologic constraints, consistent with any applicable Agency of Natural Resources rule or procedure, to ensure compliance with the requirements of this subsection
- (c) Flow Study Requirements.
- (1) Parameters for study-based, site-specific streamflow protection requirements. Site specific studies shall be sufficiently based on scientific knowledge so that the study

will aid in the Secretary's consideration of appropriate site-specific flow criteria. In the case of aquatic habitat studies, those methodologies that are acceptable for determining streamflow protection requirements pursuant to this section include hydraulic habitat studies, as well as other comparable methods of evaluation deemed appropriate by the Secretary, provided that such evaluation complies with each of the following requirements:

(A) the methodology is tailored to provide information from which to determine the relationship between aquatic habitat and streamflow;

(B) the methodology, or the scientific evaluations upon which it is based, have been subjected to peer review and evaluation, and the results of such peer review and evaluation support the conclusion that the methodology is generally acceptable.

(2) Proposals for developing site-specific flow criteria. When considering proposals for developing site-specific flow criteria in conjunction with review of an application, the Secretary may first require the filing of a study plan that defines the method to be used and provides any study details that the Secretary deems necessary, and, in the case of a study designed to evaluate the relationship between aquatic habitat and streamflow, the Secretary shall make a ruling as to the acceptability of the methodology. The Secretary need not consider any flow study unless the study plans have obtained the Secretary's approval. The plan may include Agency of Natural Resources oversight during study execution and study refinement and modification as the study proceeds. The Secretary should also establish a procedure by which completeness of the evidence in support of the proposed study-based flow could be determined prior to the Secretary's determination on the application. If the proposal is determined to be incomplete, or if the methodology which is employed is unacceptable to the Secretary, the Secretary shall issue a written request for the submission of additional evidence, with general instructions to the applicant as to the deficiency of the evidence previously submitted.

(d) Water Level Fluctuations.

(1) Class A(1) and B(1) Waters for Aquatic Habitat. Manipulation of the water level of lakes, ponds, reservoirs, riverine impoundments, and any other waters shall result in no more than a minimal deviation from the natural flow regime.

(2) Class A(2) and B(2) Waters for Aquatic Habitat or Recreation – Boating. Lakes, ponds, reservoirs, riverine impoundments, and any other waters may exhibit artificial variations in water level when subject to water level management, but only to the extent that such variations ensure full support of uses.

(e) High Flow Regime.

(1) Class A(1) and B(1) Waters for Aquatic Habitat. No change from the natural flow regime that would result in more than a minimal impact upon these waters.

(2) Class A(2) and B(2) Waters for Aquatic Habitat or Recreation – Boating. No change from the natural flow regime that would result in a change in the timing or an increase



in the frequency, magnitude, rate of change, or duration of peak flows adversely affecting channel integrity or prevent the full support of uses.

§ 29A-305 Numeric Biological Indices and Aquatic Habitat Assessments

- (a) The Secretary shall determine whether there is full support of the aquatic habitat use through appropriate methods of evaluation, including hydrogeomorphic assessments of flow characteristics, physical habitat structure, and stream processes for rivers and streams and aquatic habitat studies for lakes, ponds, and reservoirs. Applicants shall obtain the Secretary's approval of study plans prior to conducting an evaluation.
- (b) In addition to other applicable provisions of these rules and other appropriate methods of evaluation, the Secretary shall establish and apply numeric biological indices to determine whether there is full support of the aquatic biota use for each class of water. In establishing numeric biological indices, the Secretary shall establish procedures that employ standard sampling and analytical methods to characterize the biological integrity of the natural condition using reference water bodies.
- (c) Standardized sampling and analytical methods used to characterize the biological integrity of these communities are provided in Appendix G of these rules. Characteristic measures of biological integrity include community level parameters such as: species richness, diversity, relative abundance of tolerant and intolerant aquatic organisms, density, and the functional group composition.

§ 29A-306 Use-specific Management Objectives and Criteria by Class

(a) Aquatic Biota and Wildlife.

(1) Class A(1).

- (A) Management Objectives. Waters shall be managed to achieve and maintain excellent biological integrity and aquatic biota and wildlife consistent with waters in their natural condition.
- (B) Biological Criteria. Measures of biological integrity for aquatic macroinvertebrate and fish assemblages consistent with waters in their natural condition.
- (C) Nutrient Criteria. The nutrient criteria are in Table 2.

(2) Class B(1).

- (A) Management Objectives. Waters shall be managed to achieve and maintain very good biological integrity.
- (B) Biological Criteria. Change from the natural condition for aquatic macroinvertebrate and fish assemblages limited to minor changes in the relative proportions of taxonomic, functional, tolerant, and intolerant aquatic organisms.
- (C) Nutrient Criteria. The nutrient criteria are in Table 2.

(3) Classes A(2) and B(2).

- (A) Management Objectives. Waters shall be managed to achieve and maintain good biological integrity.
- (B) Biological Criteria. Change from the natural condition for aquatic macroinvertebrate and fish assemblages not exceeding moderate changes in the relative proportions of taxonomic, functional, tolerant, and intolerant aquatic organisms.
- (C) Nutrient Criteria. The nutrient criteria are in Table 2.

Table 2. Combined Nutrient Criteria for Aquatic Biota and Wildlife in Rivers and Streams<sup>1</sup>

Stream Type <sup>2</sup>	Class A(1)			Class B(1)			Classes A(2) and B(2)		
	SHG	MHG	WWMG	SHG	MHG	WWMG	SHG	MHG	WWMG
Nutrient Concentrations									
Total Phosphorus (µg/L) <sup>3</sup>	10	9	18	10	9	21	12	15	27
Nutrient Response Conditions									
pH	Not to exceed 8.5 standard units.								
Turbidity	Consistent with the criteria in § 29A-302(4) of these rules.								
Dissolved Oxygen	Consistent with the criteria in § 29A-302(5) of these rules.								
Aquatic Biota	Consistent with the criteria under § 29A-305(a) of these rules.								
<p>1. Compliance with nutrient criteria shall be achieved either by compliance with the nutrient concentration values specified above or by compliance with all nutrient response conditions. In situations where the applicable nutrient concentrations are achieved but the nutrient response conditions are not met as a result of nutrient enrichment, the Secretary may establish alternate nutrient concentration values on a site-specific basis, as necessary, to achieve compliance with the nutrient response conditions. All waters shall maintain a level of water quality that provides for the attainment and maintenance of the water quality standards of downstream waters.</p> <p>2. Stream type determinations made by the Secretary are based on biological community types that relate to stream size, gradient, and elevation. The stream types are Small High Gradient (SHG), Medium High Gradient (MHG), and Warm Water Moderate Gradient (WWMG).</p> <p>3. Not to be exceeded at low median monthly flow during June through October in a section of the stream representative of well-mixed flow.</p>									

(b) Aquatic Habitat.

(1) Class A(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain excellent quality aquatic habitat. The physical habitat structure, stream processes, and flow characteristics of rivers and streams and the physical habitat and water level of lakes and ponds shall be managed consistent with waters in their natural condition.

(B) Criteria.

- (i) Rivers and Streams. No change in flow characteristics, physical habitat structure, and stream processes outside the range of the natural condition.
- (ii) Lakes, Ponds, and Reservoirs. No change in aquatic habitat measures outside the range of the natural condition.
- (iii) Hydrology Criteria. Waters shall comply with the Hydrology Criteria in § 29A-304 of these rules.

(2) Class B(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain very high quality aquatic habitat. The physical habitat structure, stream processes, and flow characteristics of rivers and streams and physical habitat and water level of lakes and ponds necessary to fully support all life-cycle functions of aquatic biota and wildlife, including overwintering and reproductive requirements, are maintained and protected.

(B) Criteria.

- (i) Rivers and Streams. Changes to flow characteristics, physical habitat structure, and stream processes limited to minor differences from the natural condition and consistent with the full support of very high quality aquatic habitat.
- (ii) Lakes, Ponds, and Reservoirs. Changes in aquatic habitat limited to minor differences from the natural condition and consistent with very high quality aquatic habitat.
- (iii) Hydrology Criteria. Waters shall comply with the Hydrology Criteria in § 29A-304 of these rules.

(3) Classes A(2) and B(2).

(A) Management Objectives. Waters shall be managed to achieve and maintain high quality aquatic habitat. The physical habitat structure, stream processes, and flow characteristics of rivers and streams and the physical habitat and water level of lakes and ponds necessary to fully support all life-cycle functions of aquatic biota and wildlife, including overwintering and reproductive requirements, are maintained and protected.

(B) Criteria.

- (i) Rivers and Streams. Changes to flow characteristics, physical habitat structure, and stream processes limited to moderate differences from the natural condition and consistent with the full support of high quality aquatic habitat.
- (ii) Lakes, Ponds, and Reservoirs. Changes in aquatic habitat limited to moderate differences from natural condition and consistent with high quality aquatic habitat. When such habitat changes are a result of water level fluctuation, compliance may be determined on the basis of aquatic habitat studies.

(iii) Hydrology Criteria. Waters shall comply with the Hydrology Criteria in § 29A-304 of these rules.

(c) Aesthetics.

(1) Class A(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain excellent aesthetic quality.

(B) Criteria.

(i) Rivers and Streams. Water character, flows, water level, bed and channel characteristics, and flowing and falling waters in their natural condition.

(ii) Lakes, Ponds, and Reservoirs. Refer to Table 3.

(2) Classes A(2) and B(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain very good aesthetic quality.

(B) Criteria.

(i) Rivers and Streams. Water character, flows, water level, bed and channel characteristics, and flowing and falling waters of very good aesthetic value.

(ii) Lakes, Ponds, and Reservoirs. Refer to Table 3.

(3) Class B(2).

(A) Management Objectives. Waters shall be managed to achieve and maintain good aesthetic quality.

(B) Criteria.

(i) Rivers and Streams. Water character, flows, water level, bed and channel characteristics, and flowing and falling water of good aesthetic value.

(ii) Lakes, Ponds, and Reservoirs. Refer to Tables 1 and 3.

Table 3. Combined Nutrient Criteria for Aesthetics Uses in Lakes, Ponds, and Reservoirs Except for Lake Champlain and Lake Memphremagog<sup>1,2</sup>

	Class A(1)	Classes A(2) and B(1)	Class B(2)
Nutrient Concentrations			
Total Phosphorus <sup>3</sup> (µg/L)	12	17	18
Nutrient Response Conditions			
Secchi Disk Depth (meters) <sup>4</sup>	5.0	3.2	2.6
Chlorophyll-a (µg/L) <sup>3</sup>	2.6	3.8	7.0
pH	Not to exceed 8.5 standard units.		
Turbidity	Consistent with the criteria in § 29A-302(4) of these rules.		
Dissolved Oxygen	Consistent with the criteria in § 29A-302(5) of these rules.		
<p>1. Compliance with nutrient criteria shall be achieved either by compliance with the nutrient concentration values specified above or by compliance with all nutrient response conditions. In situations where the applicable nutrient concentrations are achieved but the nutrient response conditions are not met as a result of nutrient enrichment, the Secretary may establish alternate nutrient concentration values on a site-specific basis, as necessary, to achieve compliance with the nutrient response conditions. All waters shall maintain a level of water quality that provides for the attainment and maintenance of the water quality standards of downstream waters.</p> <p>2. Applies to lakes and reservoirs greater than 20 acres in surface area with a drainage area to surface area ratio less than 500:1, excluding Lake Champlain and Lake Memphremagog.</p> <p>3. June through September mean not to be exceeded in the photosynthetic depth (euphotic) zone at a central location in the lake.</p> <p>4. June through September mean not to be less at a central location in the lake.</p>			

(d) Recreation – Boating.

(1) Class A(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain excellent quality boating as compatible with the natural condition.

(B) Criteria. Boating to the full extent naturally feasible without degradation due to artificial flow and water level management or artificial physical impediments.

(2) Class B(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain very good quality boating.

(B) Criteria. Boating to the extent feasible with no more than minor degradation due to artificial flow and water level management or artificial impediments, and with appropriate mitigation for artificial physical impediments.

(3) Classes A(2) and B(2).

(A) Management Objectives. Waters shall be managed to achieve and maintain a level of water quality compatible with good quality boating.

(B) Criteria. Waters shall comply with the Hydrology Criteria in § 29A-304 of these rules.

(e) Recreation – Fishing.

(1) Class A(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain excellent quality fishing consistent with the natural condition.

(B) Criteria.

(i) Measures of wild salmonid densities, biomass, and age composition consistent with those expected in waters in their natural condition.

(ii) Waters that are designated cold water fish habitat shall comply with the Temperature Criteria in §29A-302(B) of these rules.

(2) Class B(1).

(A) Management Objectives. Waters shall be managed to achieve and maintain very good quality fishing.

(B) Criteria.

(i) Measures of wild salmonid densities, biomass, and age composition indicative of very good population levels.

(ii) Waters that are designated cold water fish habitat shall comply with the Temperature Criteria in § 29A-302(B) of these rules.

- (3) Classes A(2) and B(2).
  - (A) Management Objectives. Waters shall be managed to achieve and maintain a level of water quality compatible with good quality fishing.
  - (B) Criteria.
    - (i) Measures of wild salmonid densities, biomass, and age composition indicative of good population levels.
    - (ii) Waters that are designated cold water fish habitat shall comply with the Temperature Criteria in § 29A-302(B) of these rules.
- (f) Recreation – Swimming and Other Primary Contact Recreation.
  - (1) Class A(1).
    - (A) Management Objectives. Waters shall be managed to achieve and maintain a level of water quality compatible with excellent quality swimming and other primary contact recreation with negligible risk of illness or injury from conditions that are a result of human activities.
    - (B) Criteria. *Escherichia coli* – Not to exceed a geometric mean of 126 organisms/100ml obtained over a representative period of 60 days, and no more than 10% of samples above 235 organisms/100ml. None attributable to the discharge of wastes.
  - (2) Class A(2).
    - (A) Management Objectives. Waters shall be managed, as necessary, for consistency with use as a public water source. Where sustained direct contact with the water occurs, waters shall be managed to achieve and maintain a negligible risk of illness or injury from conditions that are a result of human activities.
    - (B) Criteria. Waters shall comply with the *Escherichia coli* Criteria in subdivision (1)(B) of this subsection.
  - (3) Class B(1).
    - (A) Management Objectives. Where sustained direct contact with the water occurs, waters shall be managed to achieve and maintain a level of water quality compatible with very good quality swimming and other primary contact recreation with negligible risk of illness or injury from conditions that are a result of human activities.
    - (B) Criteria. *Escherichia coli* – Not to exceed a geometric mean of 126 organisms/100ml obtained over a representative period of 60 days, and no more than 10% of samples above 235 organisms/100 ml.
  - (4) Class B(2).
    - (A) Management Objectives. Where sustained direct contact with the water occurs, waters shall be managed to achieve and maintain a level of water quality compatible with good quality swimming and other primary contact recreation



with negligible risk of illness or injury from conditions that are a result of human activities.

- (B) Criteria. *Escherichia coli* – Not to exceed a geometric mean of 126 organisms/100ml obtained over a representative period of 60 days, and no more than 10% of samples above 235 organisms/100 ml. In waters receiving combined sewer overflows, the representative period shall be 30 days. The Secretary may, by permit condition, waive compliance with this criterion during all or any portion of the period between October 31 and April 1, provided that a health hazard is not created. The Secretary shall provide written notice to the Vermont Department of Health prior to issuing a permit waiving compliance with this criterion.

(g) Public Water Sources.

(1) Class A(2).

- (A) Management Objectives. Waters shall be managed to achieve and maintain a uniformly excellent character and a level of water quality highly suitable for use as a public water source with filtration and disinfection or other required treatment.
- (B) Criteria. Waters shall comply with the *Escherichia coli* Criteria in subsection (f)(1)(B) of this section.

(2) Class B(2).

- (A) Management Objectives. Waters shall be managed to achieve and maintain a level of quality that is suitable for use as a public water source with filtration and disinfection or other required treatment.
- (B) Criteria. *Escherichia coli* – Not to exceed a geometric mean of 126 organisms/100ml obtained over a representative period of 60 days, and no more than 10% of samples above 235 organisms/100 ml. (h) Irrigation of Crops and Other Agricultural Uses. Class B(2). Management Objectives. Waters shall be managed to achieve and maintain a level of quality that is suitable, without treatment, for irrigation of crops used for human consumption without cooking and suitable for other agricultural uses.

§ 29A-307 Classification of Waters

Pursuant to 10 V.S.A. § 1253, all waters are classified for one or more uses as Class A(1), A(2), B(1), or B(2). Appendix F of these rules lists the specific classifications for all waters.

§ 29A-308 Fish Habitat Designation

To provide for the protection and management of fisheries, waters are designated in Appendix A as being either a cold or a warm water fish habitat. Where appropriate, such designations may be seasonal.

## Appendix A. FISH HABITAT DESIGNATION

### § A-01 Warm Water Fish Habitat

All wetlands, except those designated as cold water fish habitat in § A-02 of this appendix, and the following waters are designated as warm water fish habitat for purposes of these rules.

- (1) Battenkill, Walloomsac, Hoosic (Basin 1)
  - (A) Lake Hancock (Sucker Pond), Stamford
  - (B) Thompsons Pond, Pownal
  
- (2) Poultney, Mettawee, Southern Lake Champlain (Basins 2 & 4)
  - (A) All waters west of Vermont Route 22A.
  - (B) Austin Pond, Hubbardton
  - (C) Beebe Pond, Hubbardton
  - (D) Billings Marsh Pond, West Haven
  - (E) Burr Pond, Sudbury
  - (F) Coggman Pond, West Haven
  - (G) East Creek Site I, Orwell
  - (H) Echo Lake (Keeler Pond), Hubbardton/Sudbury
  - (I) Half Moon Pond, Hubbardton
  - (J) Hinkum Pond, Sudbury
  - (K) Lake Champlain south of the Crown Point Bridge.
  - (L) Lake Champlain, between the Crown Point Bridge and the Ferrisburg-Charlotte town boundary, where depths are less than 25 feet at Low Lake Level (93 feet NGVD) – June 1, through September 30, only.
  - (M) Lake Hortonia, Hubbardton/Sudbury
  - (N) Inman Pond, Fair Haven
  - (O) Lily Pond, Poultney
  - (P) Little Pond, Wells
  - (Q) Love's Marsh, Castleton
  - (R) Mill Pond (Parson's Mill Pond), Benson

- (S) Northeast Developer's Pond, Wells
- (T) Old Marsh Pond, Fair Haven
- (U) Perch Pond, Benson
- (V) Pine Pond, Castleton
- (W) Poultney River from Carvers Falls in West Haven to its confluence with Lake Champlain
- (X) Sunrise Lake, Benson/Orwell

(3) Otter Creek, Little Otter Creek, Lewis Creek (Basin 3)

- (A) All waters lying west of Vermont Route 22A and south of the City of Vergennes.
- (B) Brilyea East Pond, Addison
- (C) Brilyea West Pond, Addison
- (D) Chipman Lake (Tinmouth Pond), Tinmouth
- (E) Danby Pond, Danby
- (F) Fern Lake, Leicester
- (G) Lemon Fair River
- (H) Mud Pond, Leicester
- (I) Otter Creek from the outfall of the Proctor wastewater treatment facility in Proctor, to its confluence with Lake Champlain, except that portion between the Beldens Dam and the Huntington Falls Dam in New Haven/Weybridge.
- (J) Richville Pond, Shoreham
- (K) Stone Bridge Pond, Panton/Addison
- (L) Wallingford Pond, Wallingford

(4) Northern Lake Champlain (Basin 5)

- (A) All streams, creeks, and brooks in Grand Isle County.
- (B) Lake Carmi, Franklin
- (C) Lake Champlain, between the Ferrisburgh-Charlotte town boundary and the Canadian boundary, where depths are less than 25 feet at Low Lake Level (93 feet NGVD) - June 1, through September 30, only.
- (D) Bartlett Brook, South Burlington
- (E) Cutler Pond, Highgate

- (F) Englesby Brook, Burlington
- (G) Holmes Creek, Charlotte,
- (H) Indian Brook, Colchester from Vermont Routes 2 & 7 to its confluence with Lake Champlain.
- (I) Jewett Brook, St. Albans Town
- (J) Kimball Brook, Ferrisburgh
- (K) Lake Iroquois, Hinesburg/Williston
- (L) LaPlatte River from its confluence with Patrick Brook in Hinesburg extending downstream to the Spear Street extension bridge in Charlotte annually from the period June 1, through September 30, only.
- (M) Long Pond, Milton
- (N) Lower Lake, (Lake Sunset), Hinesburg
- (O) Malletts Creek, Colchester, from Vermont Routes 2 & 7 to its confluence with Lake Champlain.
- (P) McCabes Brook, Shelburne
- (Q) Milton Pond, Milton
- (R) Mud Creek Pond, Alburg
- (S) Murr (Monroe) Brook, Shelburne
- (T) Pond Brook, Colchester
- (U) Potash Brook, South Burlington
- (V) Rock River from the Canadian boundary to its confluence with Lake Champlain.
- (W) Round Pond, Milton
- (X) Rugg Brook, Georgia
- (Y) St. Albans Reservoir (N), Fairfax
- (Z) Stevens Brook, St. Albans
- (AA) Trout Brook, Milton

(5) Missisquoi (Basin 6)

- (A) Metcalf Pond, Fletcher
- (B) Fairfield Pond, Fairfield
- (C) Fairfield Swamp Pond, Fairfield

- (D) Missisquoi River from the outfall of the Enosburg Falls wastewater treatment facility to the Swanton Dam Swanton.

(6) Lamoille (Basin 7)

- (A) Arrowhead Mountain Lake, Milton/Georgia
- (B) Flagg Pond, Wheelock
- (C) Halfmoon Pond, Fletcher
- (D) Hardwick Lake, Hardwick
- (E) Horse Pond, Greensboro
- (F) Lake Elmore, Elmore
- (G) Lamoille River from the Peterson Dam in Milton to its confluence with Lake Champlain - June 1, through September 30, only.
- (H) Long Pond (Belvidere Pond), Eden
- (I) Long Pond, Greensboro
- (J) Tuttle Pond, Hardwick
- (K) Wapanaki Lake, Wolcott

(7) Winooski (Basin 8)

- (A) Berlin Pond, Berlin
- (B) Bliss Pond, Calais
- (C) Coits Pond, Cabot
- (D) Cranberry Meadow Pond, Woodbury
- (E) Curtis Pond, Calais
- (F) Gillett Pond, Richmond
- (G) Harwood Pond, Elmore
- (H) Molly's Pond, Cabot
- (I) North Montpelier Pond, East Montpelier/Calais
- (J) Richmond Pond, Richmond
- (K) Shelburne Pond, Shelburne
- (L) Sodom Pond, East Montpelier/Calais
- (M) Valley Lake (Dog Pond), Woodbury
- (N) Winooski River from Green Mountain Power Corporation #19, in Essex/Williston to its confluence with Lake Champlain – June 1, through September 30, only.

(8) White River (Basin 9)

- (A) Lamson Pond, Brookfield
- (B) Silver Lake, Barnard

(9) Ottauquechee, Black (Basins 10 & 13)

- (A) Black River from the Lovejoy Dam in Springfield to its confluence with the Connecticut River - June 1, through September 30, only.
- (B) Deweys Mill Pond, Hartford
- (C) Lake Ninevah, Mount Holly
- (D) Lake Pinneo, Hartford
- (E) Lake Runnemedede (Evert's Pond), Windsor
- (F) North Hartland Reservoir, Hartland/Hartford
- (G) North Springfield Reservoir, Springfield/Weathersfield
- (H) Ottauquechee River from the North Hartland Dam in Hartland to its confluence with the Connecticut River.

(10) West, Williams, Saxtons (Basins 11 & 13)

- (A) Burbee Pond, Windham
- (B) Cole Pond, Jamaica
- (C) Lily Pond, Londonderry
- (D) Lowell Lake, Londonderry
- (E) Mindard's Pond, Rockingham

(11) Deerfield (Basins 12 & 13)

- (A) Gates Pond, Whitingham
- (B) Grout Pond, Stratton
- (C) Howe Pond, Readsboro
- (D) Jacksonville Pond, Whitingham
- (E) Lily Pond, Vernon
- (F) North Pond, Whitingham
- (G) Sadawaga Pond, Whitingham

- (H) Shippee Pond, Whitingham
- (12) Stevens, Wells, Waits, Ompompanoosuc (Basins 14 & 16)
  - (A) Halls Lake, Newbury
  - (B) Harriman Pond, Newbury
  - (C) Lake Abenaki, Thetford
  - (D) Lake Morey, Fairlee
  - (E) Lower Symes Pond, Ryegate
  - (F) Ticklenaked Pond, Ryegate
  - (G) Waits River from the CVPS Dam in Bradford to its confluence with the Connecticut River - June 1, to September 30.
- (13) Passumpsic (Basin 15)
  - (A) Bruce Pond, Sheffield
  - (B) Chandler Pond, Wheelock
  - (C) Keiser Pond, Peacham/Danville
- (14) Upper Connecticut, Nulhegan, Willard Stream, Paul Stream (Basin 16)
  - (A) Dennis Pond, Brunswick
  - (B) Stevens Pond, Maidstone
- (15) Lake Memphremagog, Black, Barton, Clyde, Coaticook (Basin 17)
  - (A) Daniels Pond, Glover
  - (B) Lake Derby, Derby
  - (C) Long Pond, Sheffield
  - (D) Little Hosmer Pond, Craftsbury
  - (E) Mud Pond, Craftsbury
  - (F) Mud Pond, (North) Morgan
  - (G) Tildy's Pond (Clark Pond), Glover
  - (H) Toad Pond, Charleston
  - (I) Turtle Pond, Holland

§ A-02 Cold Water Fish Habitat

- (a) All waters not designated as warm water fish habitat under § A-01 of this appendix are hereby designated as cold water fish habitat for purposes of these rules.
- (b) The following wetlands are designated as cold water fish habitat:
  - (1) Those wetlands adjacent to the Dog River and its tributaries from the headwaters of the Dog River to the point where it first crosses State Aid Highway #62 in Roxbury, approximately 1.5 miles.
  - (2) Those wetlands adjacent to the headwaters of the Winhall River and its tributaries on the east and west side from the outlet of Stratton Pond to the Stratton-Winhall boundary, approximately 2.0 miles.
  - (3) Those wetlands adjacent to the Batten Kill River from a point .75 miles north of East Dorset and extending to its confluence with Dufresne Pond in Manchester, approximately 5.5 miles.
  - (4) Those wetlands adjacent to the New Haven River and its tributaries from its confluence with Blue Bank Brook in Lincoln upstream to the headwaters of the respective tributaries, approximately 1.75 miles.



Appendix B. DESCRIPTION OF LAKE CHAMPLAIN AND LAKE MEMPHREMAGOG  
SEGMENTS FOR APPLICATION OF PHOSPHORUS CRITERIA

Segment	Description
Lake Champlain	
Missisquoi Bay	Area north of East Alburgh (Route 78) bridge and south of the international border.
Isle La Motte	Area within Vermont waters west of Grand Isle and North Hero Islands, and north of a line from Cumberland Head, NY to Wilcox Point on Grand Isle.
St. Albans Bay	Area northeast of a line from Hathaway Point to Lime Rock Point.
Northeast Arm	Area within Vermont waters east of Grand Isle and North Hero Islands, and north of the Sandbar Bridge, excluding St. Albans Bay, and including the large bays on Grand Isle and North Hero.
Malletts Bay	Area south of Sandbar Bridge and east of the causeway from Colchester Point to Grand Isle.
Main Lake	Area within Vermont waters south of a line from Cumberland Head, NY to Wilcox Point on Grand Isle, and north of a line from Split Rock Point, NY to Thompsons Point, VT, excluding Malletts Bay, Burlington Bay and Shelburne Bay.
Burlington Bay	Area east of a line from Lone Rock Point to Oakledge.

Shelburne Bay	Area south of a line from Shelburne Point to Red Rock Point.
Otter Creek	Area within Vermont waters south of a line from Split Rock Point, NY to Thompsons Point, VT, and north of a line from Rock Harbor, NY to Basin Harbor, VT.
Port Henry	Area within Vermont waters south of a line from Rock Harbor, NY to Basin Harbor, VT, and north of Crown Point Bridge.
South Lake A	Area within Vermont waters south of Crown Point Bridge and north Benson Landing.
South Lake B	Area within Vermont waters south of Benson Landing.
Lake Memphremagog	
Main Lake	Area within Vermont waters north of the Route 5 Bridge.
South Bay	Area south of the Route 5 bridge and north of the mouth of the Barton River.

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
<i>Toxic Metals</i>							
Aluminum pH 5.0 – 10.5	EPA 7429905	7429905	TT	---	---	See Appendix K of EPA December 2018 water quality criteria document for Aluminum, which provides lookup tables for various water chemistry conditions. The <a href="#">Aluminum Criteria Calculator V2.0</a> can also be used to determine criteria. <sup>f</sup>  Application of this criteria is described in the Implementation Procedure for Aluminum. <sup>g</sup>	
Antimony	65FR66443	7440360	TT	5.6	640	---	---
Arsenic	65FR31682	7440382	A	0.02 <sup>h</sup>	1.5 <sup>h</sup>	340	150
Cadmium <sup>d.e.</sup>	81FR19176 EPA 820-R-16-002	7440439	TT	---	---	0.94	0.43
Chromium (VI) <sup>d</sup>	65FR31682	18540299	TT	---	---	16	11
Chromium (III) <sup>d.e.</sup>	EPA820/B-96-001	16065831	TT	---	---	322	42
Copper <sup>d.e.o.</sup>	65FR31682	7440508	TT	---	---	7.0	4.95
Cyanide	80FR36986-02 EPA 820-R-15-031	57125	TT	4	400	22 <sup>n</sup>	5.2 <sup>n</sup>

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Iron <sup>c</sup>	EPA 440/5-86-001	7439896	TT	300	---	---	1,000
Lead <sup>d,e</sup>	65FR31682	7439921	TT	---	---	30.1	1.17
Mercury	62FR42160 EPA 440/5-86-001	7439976	TT/BC	---	---	1.4 <sup>d,f</sup>	0.012 (1986)
Methylmercury	EPA823-R-01-001	22967926	---	---	0.3 mg/kg <sup>l</sup>	---	---
Nickel <sup>d,e</sup>	65FR31682	7440020	TT	610	4,600	260	29
Selenium	62FR42160 65FR31682 65FR66443	7782492	TT	170	4200	See EPA June 2016 water criteria document for Selenium (Table 1), <sup>p,q</sup>	
Silver <sup>d,e</sup>	65FR31682	7440224	TT	---	---	1.02	---
Thallium	68FR75510	7440280	TT	0.24	0.47	---	---
Zinc <sup>d,e</sup>	65FR31682	7440666	TT	---	---	65	65
<i>Volatile Organic Compounds</i>							
Acrolein	80FR36986-02 EPA 820-R-15-003	107028	TT	3	400	3	3

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Acrylonitrile	80FR36986-02 EPA 820-R-15-004	107131	C	0.061	7.0	---	---
Benzene	80FR36986-02 EPA 820-R-15-009	71432	A	2.1	58	---	---
Bromoform	80FR36986-02 EPA 820-R-15-021	75252	C	7.0	120	---	---
Carbon Tetrachloride	80FR36986-02 EPA 820-R-15-023	56235	C	0.4	5	---	---
Chlorodibromomethane	80FR36986-02 EPA 820-R-15-026	124481	C	0.80	21	---	---
Chloroform	80FR36986-02 EPA 820-R-15-027	67663	C	60	2,000	---	---
Dichlorobromomethane	80FR36986-02 EPA 820-R-15-033	75274	C	0.95	27	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter ( $\mu\text{g/l}$  - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
1,2-Dichloroethane	80FR36986-02 EPA 820-R-15-075	107062	C	9.9	650	---	---
1,1-Dichloroethylene	80FR36986-02 EPA 820-R-15-071	75354	C	300	20,000	---	---
1,2-Dichloropropane	80FR36986-02 EPA 820-R-15-076	78875	---	0.90	31	---	---
1,3-Dichloropropylene	80FR36986-02 EPA 820-R-15-080	542756	TT	0.27	12	---	---
Ethylbenzene	80FR36986-02 EPA 820-R-15-042	100414	TT	68	130	---	---
Methyl Bromide	80FR36986-02 EPA 820-R-15-056	74839	TT	100	10,000	---	---
Methylene Chloride	80FR36986-02 EPA 820-R-15-057	75092	C	20	1,000	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Monochlorobenzene	80FR36986-02 EPA 820-R-15-025	108907	TT	100	800	---	---
1,1,2,2-Tetrachloroethane	80FR36986-02 EPA 820-R-15-069	79345	C/BC	0.2	3	---	---
Tetrachloroethylene	80FR36986-02 EPA 820-R-15-063	127184	C	10	29	---	---
Toluene	80FR36986-02 EPA 820-R-15-064	108883	TT	57	520	---	---
1,2-Trans-Dichloroethylene (DCE)	80FR36986-02 EPA 820-R-15-078	156605	---	100	4,000	---	---
1,1,1-Trichloroethane	80FR36986-02 EPA 820-R-15-068	71556	---	10,000	200,000	---	---
1,1,2-Trichloroethane	80FR36986-02 EPA 820-R-15-070	79005	C	0.55	8.9	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter ( $\mu\text{g/l}$  - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Trichloroethylene (TCE)	80FR36986-02 EPA 820-R-15-070	79016	C	0.6	7	---	---
<i>Acid Organic Compounds</i>							
Vinyl Chloride	80FR36986-02 EPA 820-R-15-067	75014	C	0.022	1.6	---	---
2-Chlorophenol	80FR36986-02 EPA 820-R-15-089	95578	---	30	800	---	---
2,4-Dichlorophenol	80FR36986-02 EPA 820-R-15-084	120832	TT	10	60	---	---
2,4-Dimethylphenol	80FR36986-02 EPA 820-R-15-085	105679	---	100	3,000	---	---
Dinitrophenols	80FR36986-02 EPA 820-R-15-038	25550587	TT	10	1,000	---	---
2,4 Dinitrophenol	80FR36986-02 EPA 820-R-15-086	51285	TT	10	300	---	---



Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
2-Methyl-4,6-Dinitrophenol	80FR36986-02 EPA 820-R-15-090	534521	TT	2	30	---	---
Pentachlorobenzene	80FR36986-02	608935	BC	0.1	0.1	---	---
Pentachlorophenol	80FR36986-02 EPA 820-R-15-060	87865	C/BC	0.03	0.04	19 <sup>k</sup>	15 <sup>k</sup>
Phenol	80FR36986-02 EPA 820-R-15-061	108952	TT	4,000	300,000	---	---
Nonylphenol	EPA-822-F05-003	84852153	C/BC	---	---	28	6.6
2,4,6-Trichlorophenol	80FR36986-02 EPA 820-R-15-083	88062	C/BC	1.5	2.8	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
<i>Base Neutral Compounds</i>							
Acenaphthene	80FR36986-02 EPA 820-R-15-002	83329	---	70	90	---	---
Anthracene	80FR36986-02 EPA 820-R-15-008	120127	TT/BC	300	400	---	---
Benzidine	80FR36986-02 EPA 820-R-15-010	92875	A	0.00014	0.011	---	---
Benzo(a)Anthracene	80FR36986-02 EPA 820-R-15-011	56553	C/BC	0.0012	0.0013	---	---
Benzo(a)Pyrene	80FR36986-02 EPA 820-R-15-012	50328	C/BC	0.00012	0.00013	---	---
Benzo(b)Fluoranthene	80FR36986-02 EPA 820-R-15-013	205992	C/BC	0.0012	0.0013	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Benzo(k)Fluoranthene	80FR36986-02 EPA 820-R-15-014	207089	C/CB	0.012	0.013	---	---
Bis(Chloromethyl) Ether (BCME)	80FR36986-02 EPA 820-R-15-017	542881	C	0.00015	0.017	---	---
Bis(2-Ethylhexyl)Phthalate	80FR36986-02 EPA 820-R-15-020	117817	C/BC	0.32	0.37	---	---
Butylbenzyl Phthalate <sup>w</sup>	80FR36986-02 EPA 820-R-15-022	85687	C/BC	0.10	0.10	---	---
Chloroethyl ether (Bis-2)	80FR36986-02 EPA 820-R-15-018	111444	C	0.030	2.2	---	---
Chloroisopropyl ether(Bis-2)	80FR36986-02 EPA 820-R-15-019	108601	TT	200	4,000	---	---
2-Chloronaphthalene	80FR36986-02 EPA 820-R-15-088	91587	---	800	1,000	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter ( $\mu\text{g/l}$  - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Chrysene	80FR36986-02 EPA 820-R-15-030	218019	C/BC	0.12	0.13	---	---
Dibenzo(a,h)Anthracene	80FR36986-02 EPA 820-R-15-032	53703	C/BC	0.00012	0.00013	---	---
1,2-Dichlorobenzene	80FR36986-02 EPA 820-R-15-074	95501	TT/BC	1,000	3,000	---	---
1,3-Dichlorobenzene	80FR36986-02 EPA 820-R-15-079	541731	TT/BC	7	10	---	---
1,4-Dichlorobenzene	80FR36986-02 EPA 820-R-15-081	106467	TT/BC	300	900	---	---
3,3'-Dichlorobenzidine	80FR36986-02 EPA 820-R-15-091	91941	C/BC	0.049	0.15	---	---
Diethyl Phthalate	80FR36986-02 EPA 820-R-15-035	84662	TT	600	600	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Dimethyl Phthalate	80FR36986-02 EPA 820-R-15-036	131113	TT	2,000	2,000	---	---
Di-n-butyl Phthalate	80FR36986-02 EPA 820-R-15-037	84742	TT/BC	20	30	---	---
2,4-Dinitrotoluene	80FR36986-02 EPA 820-R-15-087	121142	C	0.049	1.7	---	---
1,2-Diphenylhydrazine	80FR36986-02 EPA 820-R-15-077	122667	C	0.03	0.2 <sup>b</sup>	---	---
Fluoranthene	80FR36986-02 EPA 820-R-15-043	206440	TT/BC	20	20	---	---
Fluorene	80FR36986-02 EPA 820-R-15-044	86737	TT/BC	50	70	---	---
Hexachlorobenzene	80FR36986-02 EPA 820-R-15-048	118741	C/BC	0.000079	0.000079	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter ( $\mu\text{g/l}$  - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Hexachlorobutadiene	80FR36986-02 EPA 820-R-15-049	87683	C/BC	0.01	0.01	---	---
Hexachlorocyclohexane (HCH) -Technical	80FR36986-02 EPA 820-R-15-050	608731	C	0.0066	0.010	---	---
Hexachlorocyclopentadiene	80FR36986-02 EPA 820-R-15-051	77474	TT/BC	4	4	---	---
Hexachloroethane	80FR36986-02 EPA 820-R-15-052	67721	C/BC	0.1	0.1	---	---
Indeno(1,2,3-cd) Pyrene	80FR36986-02 EPA 820-R-15-053	193395	C/BC	0.0012	0.0013	---	---
Isophorone	80FR36986-02 EPA 820-R-15-054	78591	TT	34	1,800	---	---
3-Methyl-4-Chlorophenol	80FR36986-02 EPA 820-R-15-092	59507	---	500	2,000	---	---

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Nitrobenzene	80FR36986-02 EPA 820-R-15-058	98953	TT	10	600	---	---
N-Nitrosodimethylamine	65FR66443	62759	C	0.00069 <sup>h</sup>	3.0 <sup>h</sup>	---	---
N-Nitrosodi-n-Propylamine	65FR66443	621647	---	0.0050 <sup>h</sup>	0.51 <sup>h</sup>	---	---
N-Nitrosodiphenylamine	65FR66443	86306	C	3.3 <sup>h</sup>	6.0 <sup>h</sup>	---	---
Pyrene	80FR36986-02 EPA 820-R-15-062	129000	TT/BC	20	30	---	---
1,2,4,5-Tetrachlorobenzene	80FR36986-02 EPA 820-R-15-073	95943	TT	0.03	0.03	---	---
1,2,4-Trichlorobenzene	80FR36986-02 EPA 820-R-15-072	120821	---	0.071	0.076	---	---
2,4,5-Trichlorophenol	80FR36986-02 EPA 820-R-15-082	95954	---	300	600	---	---
<i>Pesticides/PCBs</i>							

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Aldrin	80FR36986-02 EPA 820-R-15-005	309002	C/BC	0.00000077	0.00000077	3.0 <sup>b</sup>	---
Carbaryl	EPA-820-R-12-007	63252	TT	---	---	2.1	2.1
Chlordane	80FR36986-02 EPA 820-R-15-024	57749	C/BC	0.00031	0.00032	2.4 <sup>b</sup>	.004 <sup>b</sup>
Chorophenoxy Herbicide (2,4-D)	80FR36986-02 EPA 820-R-15-028	94757	C	1,300	12,000	---	---
Chorophenoxy Herbicide (2,4,5-TP) [Silvex]	80FR36986-02 EPA 820-R-15-029	93-72-1	C	100	400	---	---
Chlorpyrifos <sup>c</sup>	EPA 440/5-86-001	2921882	---	---	---	0.083	0.041
4,4'-DDT	80FR36986-02 EPA 820-R-15-095	50293	C/BC	0.000030	0.000030	1.1 <sup>b</sup>	0.001 <sup>b</sup>



Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter ( $\mu\text{g/l}$  - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
4,4'-DDE	80FR36986-02 EPA 820-R-15-094	72559	C/BC	0.000018	0.000018	---	---
4,4'-DDD	80FR36986-02 EPA 820-R-15-093	72548	C/BC	0.00012	0.00012	---	---
Demeton <sup>c</sup>	EPA 440/5-86-001	8065483	---	---	---	---	0.1
Diazinon	EPA-822-R-05-006	333415	TT	---	---	0.17	0.17
Dieldrin	80FR36986-02 EPA 820-R-15-034	60571	C	0.0000012	0.0000012	0.24	0.056

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
alpha-Endosulfan	80FR36986-02 EPA 820-R-15-007	959988	TT	20	30	0.22 <sup>b</sup>	0.056 <sup>b</sup>
beta-Endosulfan	80FR36986-02 EPA 820-R-15-016	33213659	TT	20	40	0.22 <sup>b</sup>	0.056 <sup>b</sup>
Endosulfan Sulfate	80FR36986-02 EPA 820-R-15-039	1031078	TT	20	40	---	---
Endrin	80FR36986-02 EPA 820-R-15-040	72208	TT	0.03	0.03	0.086	0.036
Endrin Aldehyde	80FR36986-02 EPA 820-R-15-041	7421934	TT	1	1	---	---
Guthion	EPA 440/5-86-001	86500	-				0.01

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Heptachlor	80FR36986-02 EPA 820-R-15-046	76448	C	0.0000059	0.0000059	0.52 <sup>b</sup>	0.0038 <sup>b</sup>
Heptachlor Epoxide	80FR36986-02 EPA 820-R-15-047	1024573	C	0.000032	0.000032	0.52 <sup>b</sup>	0.0038 <sup>b</sup>
Benzene hexachloride-alpha	80FR36986-02 EPA 820-R-15-006	319846	C/BC	0.00036	0.00039	---	---
Benzene hexachloride-beta	80FR36986-02 EPA 820-R-15-015	319857	C/BC	0.0080	0.014	---	---
Benzene hexachloride-gamma (Lindane)	EPA 820-R-15-045	58899	TT/BC	4.2	4.4	0.95	---
Malathion <sup>c</sup>	EPA 440/5-86-001	121755	---	---	---	---	0.1
Methoxychlor	80FR36986-02 EPA 820-R-15-055	72435	TT	0.02	0.02	---	0.03
Mirex	EPA 440/5-86-001	2385855	---				0.001

Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA

Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Parathion <sup>c</sup>	EPA 440/5-86-001	56382	---	---	---	0.065	0.013
Total PCB's <sup>m</sup>	65FR31682	53469219	C/BC	0.000064 <sup>h</sup>	0.000064 <sup>h</sup>	---	0.014 <sup>b</sup>
	65FR66443						
Dioxin (2,3,7,8-TCDD)	65FR66443	1746016	C/BC	5.0x10 <sup>-9</sup>	5.1x10 <sup>-9</sup>	---	---
Toxaphene	80FR36986-02	8001352	C/BC	0.00070	0.00071	0.73	0.0002
	EPA 820-R-15-065						
Tributyltin (TBT)	EPA 822-R-03-031		---			0.46	0.072
<i>Other Substances</i>							
Ammonia	EPA 822-R-13-001	7664417	---	---	---	See EPA April 2013 water quality criteria document for Ammonia. Tables 5a and 5b provide the acute criteria values and Table 6 provides the chronic criteria. <sup>c, p</sup>	
Asbestos	57FR60848	1332214	A	7 million fibers/L	---	---	---
Barium <sup>c</sup>	EPA 440/5-86-001	7440393	---	1,000	---	---	---

**Appendix C. WATER QUALITY CRITERIA FOR THE PROTECTION OF HUMAN HEALTH AND AQUATIC BIOTA**

**Criteria are in micrograms per liter (µg/l - parts per billion) unless indicated otherwise.**

Compound	FR Cite/Source	CAS Number	Protection of Human Health			Protection of Aquatic Biota	
			Tox Class	Consumption of Water & Organisms	Consumption of Organisms Only	Maximum Allowable Concentration - Acute Criteria	Average Allowable Concentration - Chronic Criteria <sup>a</sup>
Chlorine <sup>c</sup>	EPA 440/5-86-001	7782505	---	---	---	19	11
Chloride <sup>c</sup>	53FR19028	16887006	---	---	---	860,000	230,000

**GENERAL NOTES:**

This Appendix has been updated to reflect USEPA recommendations as of August 2021.

Tox Class - designated toxicity class for substance: A=Class A carcinogen (known human carcinogen); C=Carcinogenic (probable or possible human carcinogen); TT=Threshold Toxicant (not a known or probable carcinogen); BC=High potential to bioconcentrate or bioaccumulate

Carcinogenic - for those toxic substances that are identified as carcinogens (A or C) the criteria have been established at a risk level of 10<sup>-6</sup> assuming a lifetime exposure to a 80 Kg male consuming 22 grams per day of fish and shell-fish products and ingesting 2.4 liters of water per day.

Threshold Toxicants - for those toxic substances that are identified as non-carcinogens (TT) the criteria are best estimates of concentrations that are not expected to produce adverse effects in human health assuming a lifetime exposure to a 80 Kg male consuming 22 grams per day of fish and shell-fish products and ingesting 2.4 liters of water per day.

**Footnotes:**

a. Maximum Allowable Concentration (MAC) = the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (1-hour average) once every three years without deleterious effects. Average Allowable Concentration (AAC) - the highest concentration of a pollutant to which aquatic life can be exposed for an

extended period of time (4 days) once every three years without deleterious effects.  $\mu\text{g/l}$  = micrograms per liter. The MAC is the equivalent to the Federal Criteria Maximum Concentration (CMC) and the AAC is equivalent to the Federal Criteria Continuous Concentration (CCC).

- b. The aquatic life criteria for this compound were developed in 1980 using 1980 EPA guidelines for criteria development. The MAC (CMC) or acute value shown is a final acute value (FAV) that by the 1980 guidelines is an instantaneous value.
- c. The EPA 2013 Aquatic Life Ambient Criteria for Ammonia document is posted at <https://dec.vermont.gov/sites/dec/files/documents/epa-2013-aquatic-life-criteria-ammonia.pdf>.
- d. Criteria for this metal are expressed in terms of dissolved metal in the water column. Dissolved metal concentrations in the water column can be determined analytically or can be estimated from total metal concentrations using the conversion factors in Appendix D.
- e. Aquatic life criteria for this metal is expressed as a function of total hardness ( $\text{mg/l}$  as  $\text{CaCO}_3$ ) in the water column and as a function of the pollutant's water effect ratio, WER, as defined in § 131.36(c). Unless otherwise determined by the Secretary, in a manner consistent with the most current USEPA guidance, the WER shall be 1.0. The specific value given here corresponds to a hardness of 50  $\text{mg/l}$ . Criteria values for other hardness may be calculated from the equations shown in Appendix E.
- f. This criterion was derived from data for inorganic mercury (II) but is applied here to total mercury.
- g. Vermont promulgated numerical criteria for arsenic based on freshwater fish species bioconcentration factors (BCF). A BCF of 4 was used to calculate human health protection criteria.
- h. This criterion has been revised to reflect The Environmental Protection Agency's  $q1^*$  or RfD, as contained in the Integrated Risk Information System (IRIS) as of May 17, 2002. The fish tissue bioconcentration factor (BCF) from the 1980 Ambient Water Quality Criteria document was retained in each case.
- i. No longer applicable.
- j. This human health criterion is the same as originally published in the Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value is now published in the Gold Book.
- k. Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows:  $\text{MAC} = \exp(1.005(\text{pH})-4.869)$ ;  $\text{AAC} = \exp(1.005(\text{pH})-5.134)$ . Values displayed in table correspond to a pH of 7.8.
- l. This fish tissue residue criterion for methylmercury is used for the purpose of determination of attainment pursuant to these Standards. Fish consumption advisory guidance for

mercury in fish taken from the waters of Vermont is developed by the Vermont Department of Health and is available on their website.

- m. These criteria apply to total PCB's (e.g. the sum of all congener or all isomer or homolog or Arochlor analyses).
- n. These criteria expressed as ug free cyanide (as CN)/l.
- o. When site specific data are available, the Biotic Ligand Model (BLM) identified in EPA's Aquatic Life Ambient Freshwater Quality Criteria – Copper (2007), EPA-822-R-07-001 will be used instead of the hardness-based criteria. The Implementation Procedure for Copper which describes data requirements is posted at <https://dec.vermont.gov/sites/dec/files/documents/vermont-implementation-procedure-copper.pdf>.
- p. For chronic criteria that utilize 30-day average duration, 30Q10 flows shall apply.
- q. The EPA 2021 Revision to the 2016 Aquatic Life Ambient Water Quality Criterion for Selenium document is posted at <https://dec.vermont.gov/sites/dec/files/documents/epa-2021-revision-2016-aquatic-life-criteria-selenium.pdf>.
- r. The EPA 2018 Aquatic Life Ambient Water Quality Criteria for Aluminum document is posted at <https://dec.vermont.gov/sites/dec/files/documents/epa-2018-aquatic-life-criteria-aluminum.pdf> and the Aluminum Criteria Calculator can be downloaded at <https://www.epa.gov/wqc/aquatic-life-criteria-aluminum>.
- s. The Implementation Procedure for Aluminum is posted at <https://dec.vermont.gov/sites/dec/files/documents/vermont-implementation-procedure-aluminum.pdf>.

Appendix D. CONVERSION FACTORS FOR ESTIMATING DISSOLVED METALS FROM TOTAL VALUES

To convert total metal values to dissolved metal, multiply total metal values/concentrations by the conversion factor listed (or calculated) in the table below. Alternative methods for translating total to dissolved values following USEPA guidance (“The Metals Translator: Guidance for Calculating a Total Recoverable Metals Permit Limit from a Dissolved Criterion”; EPA 823-B-96-007) may be considered on a case-by-case basis.

<b>Metal</b>	<b>Conversion Factor for MAC</b>	<b>Conversion Factor for AAC</b>
<b>Arsenic</b>	1.0	1.0
<b>Cadmium</b>	$1.136672 - [(\ln \text{hardness})(0.041838)]$	$1.101672 - [(\ln \text{hardness})(0.041838)]$
<b>Chromium III</b>	0.316	0.860
<b>Chromium VI</b>	0.982	0.962
<b>Copper</b>	0.96	0.96
<b>Lead</b>	$1.46203 - [(\ln \text{hardness})(0.145712)]$	$1.46203 - [(\ln \text{hardness})(0.145712)]$
<b>Mercury</b>	0.85	0.85
<b>Nickel</b>	0.998	0.997
<b>Selenium</b>	---	---
<b>Silver</b>	0.85	---
<b>Zinc</b>	0.978	0.986



Appendix E. PARAMETERS FOR CALCULATING FRESHWATER TOTAL METALS CRITERIA THAT ARE HARDNESS DEPENDENT

MAC and AAC values are calculated using the equations below the table and inserting the metal-specific values shown in the table.

<b>Metal</b>	<b>m<sub>A</sub></b>	<b>b<sub>A</sub></b>	<b>m<sub>C</sub></b>	<b>b<sub>C</sub></b>
<b>Cadmium</b>	0.9789	-3.866	0.7977	-3.909
<b>Chromium III</b>	0.8190	3.7256	0.8190	0.6848
<b>Copper</b>	0.9422	-1.700	0.8545	-1.702
<b>Lead</b>	1.273	-1.460	1.273	-4.705
<b>Nickel</b>	0.8460	2.255	0.8460	0.0584
<b>Silver</b>	1.72	-6.59	---	---
<b>Zinc</b>	0.8473	0.884	0.8473	0.884

Hardness-dependent metals criteria can be calculated from the following equations:

$$\text{MAC (dissolved)} = \exp\{m_A [\ln (\text{hardness})] + b_A\} \text{ (Conversion Factor from Appendix D)}$$

$$\text{AAC (dissolved)} = \exp\{m_C [\ln (\text{hardness})] + b_C\} \text{ (Conversion Factor from Appendix D)}$$

## Appendix F. WATER QUALITY CLASSIFICATIONS

- (a) The classification of all waters has been established by a combination of legislative acts and by classification or reclassification decisions issued by the Water Resources Board or Secretary pursuant to 10 V.S.A. § 1253. Those waters reclassified by the Secretary to Class A(1), A(2), or B(1) for any use shall include all waters within the entire watershed of the reclassified waters unless expressly provided otherwise in the rule.
- (b) All waters above 2,500 feet altitude, National Geodetic Vertical Datum, are designated Class A(1) for all uses, unless specifically designated Class A(2) for use as a public water source.
- (c) All waters at or below 2,500 feet altitude, National Geodetic Vertical Datum, are designated Class B(2) for all uses, unless specifically designated as Class A(1), A(2), or B(1) for any use.
- (d) The waters listed in the following table are those waters classified as A(1), A(2), or B(1) for one or more designated uses.

Appendix F. WATER QUALITY CLASSIFICATIONS Waters	Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Battenkill, Walloomsac, Hoosic (Basin 1)</b>										
<b>Battenkill</b>										
<b>Unnamed tributary to Bromley Brook.</b> Abandoned – Village of Manchester water source. The first unnamed tributary to Bromley Brook and all waters within its watershed upstream of the Manchester Water Company intake. The tributary is the first tributary on the right upstream of Bromley Brook’s confluence with Bourn Brook. The intake is approximately 0.5 mile upstream of its juncture with Bromley Brook.	A2	A2	A2	A2	A2	A2	A2	B2	6/30/64	0.5 mile
<b>*Surface waters of the Glastenbury Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally designated Glastenbury Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	1/15/17	Refer to Map 4
<b>*Surface waters of the Lye Brook Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally designated Lye Brook Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	1/15/17	Refer to Map 4
<b>Walloomsac River</b>										
<b>Basin Brook and Furnace Brook.</b> Basin Brook – Permanent; Furnace Brook – Abandoned – Village of North Bennington (WSID 5017) water sources. Basin Brook and all waters within its watershed to and including the North Bennington Reservoir in the Towns of Glastenbury and Shaftsbury.	A2	A2	A2	A2	A2	A2	A2	B2	12/23/52	5.0 miles

Appendix F. WATER QUALITY CLASSIFICATIONS Waters	Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Bolles Brook.</b> Permanent – Village of Bennington (WSID 5016) water source. That portion of Bolles Brook and all waters within its watershed in the Towns of Glastenbury and Woodford upstream of the Bennington water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	5.3 miles
<b>Sucker Pond (Lake Hancock) and tributaries.</b> Emergency – Village of Bennington (WSID 5016) water source. Lake surface and all waters within its watershed in Stamford.	A2	A2	A2	A2	A2	A2	A2	B2	12/23/52	70 acres
<b>Barney Brook.</b> Abandoned – Village of Bennington water source. That portion of Barney Brook and all waters within its watershed in the Town of Woodford upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.3 miles
<b>Unnamed tributary to South Stream.</b> Abandoned – Village of Bennington water source. That portion tributary to South Stream and all waters within its watershed in the Town of Woodford upstream of the water intake in Bennington.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.0 mile
<b>Hoosic River</b>										
<b>Roaring Branch.</b> Abandoned – Town of Bennington water source. That portion of Roaring Branch and all waters within its watershed in the Town of Stamford upstream of the water intake in Pownal.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	2.3 miles
<b>Unnamed tributaries.</b> Abandoned – Village of Pownal water source. That portion of unnamed tributaries and their watersheds on Mann Hill in the Town of Pownal upstream of the water intake in Oak Hill Cemetery.	A2	A2	A2	A2	A2	A2	A2	B2	3/6/59	2.9 miles

Appendix F. WATER QUALITY CLASSIFICATIONS										
Waters	Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Reservoir Hollow Brook.</b> Abandoned – Village of North Pownal water source. Reservoir Hollow Brook and reservoir and all waters within its watershed. (Reservoir is approximately 0.5 mile upstream of the Hoosic River).	A2	A2	A2	A2	A2	A2	A2	B2	3/6/59	0.8 mile
<b>Ladd Brook.</b> Abandoned – Village of Pownal water source. Ladd Brook and all waters within its watershed in the Town of Pownal.	A2	A2	A2	A2	A2	A2	A2	B2	3/6/59	1.5 miles
<b>Poultney, Mettawee, Southern Lake Champlain (Basins 2 &amp; 4)</b>										
<b>Poultney River</b>										
<b>Inman Pond.</b> Permanent – Village of Fair Haven (WSID 5218) water source. Inman Pond and all waters within its watershed in Fair Haven.	A2	A2	A2	A2	A2	A2	A2	B2	6/15/67	79 acres (Pond only)
<b>Sucker Creek.</b> Abandoned – Village of Fair Haven water source. Sucker Creek and all waters within its watershed upstream of the Howard Dam and Sheldon Dam, both located in Fair Haven.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	0.6 mile

Appendix F. WATER QUALITY CLASSIFICATIONS Waters	Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Otter Creek, Little Otter Creek, Lewis Creek (Basin 3)</b>										
<b>Upper Otter Creek</b>										
* <b>Surface waters of the Big Branch Wilderness Areas.</b> All streams, lakes, and ponds located within the boundaries of the federally designated Big Branch Wilderness Areas of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 3
* <b>Surface waters of the Peru Peak Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally designated Peru Peak Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 3
* <b>Surface waters of the Robert T. Stafford White Rocks National Recreation Areas.</b> All streams, lakes, and ponds located within the boundaries of the federally designated Robert T. Stafford White Rocks National Recreation Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 3
<b>Unnamed tributary to Cold River.</b> Abandoned – City of Rutland water source. Unnamed tributary to Cold River and all waters within its watershed upstream of its diversion into the Mendon Brook watershed in Killington.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	2.0 miles
<b>Mendon Brook.</b> Permanent – City of Rutland (WSID 5229) water source. Mendon Brook and all waters within its watershed upstream of the water intake just south of Meadow Lake Drive in the Town of Mendon.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	6.0 miles

Appendix F. WATER QUALITY CLASSIFICATIONS Waters	Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Tenney Brook.</b> Abandoned – Rutland-Mendon Town water source. Tenney Brook and all waters with its watershed upstream of and including a small intake impoundment.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	2.0 miles
<b>Rutland City Reservoir.</b> Permanent – City of Rutland (WSID 5229) water source. Rutland City Reservoir in Rutland Town and all waters within its watershed in Rutland Town and Mendon.	A2	A2	A2	A2	A2	A2	A2	B2	Legis. <sup>1</sup>	No record
<b>Moon Brook.</b> Abandoned – Gleason Road water system. Moon Brook and all waters within its watershed in Mendon upstream of and including a small intake impoundment.	A2	A2	A2	A2	A2	A2	A2	B2	Legis. <sup>1</sup>	2.0 miles
<b>Unnamed tributary to Tenney Brook.</b> Abandoned – Gleason Road water system. Unnamed tributary to Tenney Brook and all waters within its watershed in Mendon upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	Legis. <sup>1</sup>	1.1 miles
<b>Young's Brook.</b> Abandoned – Village of West Rutland water source. Young's Brook and reservoir and all waters within its watershed in West Rutland and Ira upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	2.0 miles
<b>Furnace Brook and Kiln Brook.</b> Furnace Brook – Emergency; Kiln Brook – Abandoned – Village of Proctor (WSID 5228) water sources. Furnace Brook and Kiln Brook and all waters within their watersheds in Chittenden upstream of their confluence.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	5.5 miles

<sup>1</sup> These waters were classified as a result of 1949 and 7/1/71 legislation that defined what constituted Class A waters. Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A

Appendix F. WATER QUALITY CLASSIFICATIONS Waters	Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Sugar Hollow Brook.</b> Abandoned – Town of Brandon water source. Sugar Hollow Brook and all waters within its watershed in Goshen and Chittenden upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	2.0 miles
<b>Leicester Hollow Brook.</b> Abandoned – Town of Brandon water source. Leicester Hollow Brook and all waters within its watershed in Leicester upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	2/17/61	2.0 miles
<b>Lower Otter Creek</b>										
<b>Alder Brook.</b> Alder Brook and all waters within its watershed.	A1	A1	A1	B2	B2	B2	B2	B2	2	12.2 miles
<b>Blue Bank Brook.</b> Blue Bank Brook and all waters within its watershed.	A1	A1	A1	B2	B2	B2	B2	B2	2	10.3 miles
<b>Goshen Brook.</b> Goshen Brook and all waters within its watershed upstream to the boundaries of the federally designated Joseph Battell Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	B2	B2	B2	B2	B2	2	1.5 miles
<b>*Surface waters of the Breadloaf Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally designated Breadloaf Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	1/15/17	Refer to Map 1 and Map 2
<b>*Surface waters of the Bristol Cliffs Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally designated Bristol Cliffs Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	1/15/17	Refer to Map 1

2 Effective as of adoption of these rules.



<p><b>*Surface waters of the Joseph Battell Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally designated Joseph Battell Wilderness Area of the Green Mountain National Forest.</p>	A1	A1	A1	A1	A1	A1	B2	B2	1/15/17	Refer to Map 1 and Map 2
<p>Appendix F. WATER QUALITY CLASSIFICATIONS</p> <p><b>Waters</b></p>	Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<p><b>*Surface waters of the Moosalamoo National Recreation Area.</b> All streams, lakes, and ponds located within the boundaries of the federally designated Moosalamoo National Recreation Area of the Green Mountain National Forest, <i>except</i> for all waters managed by the Silver Lake Hydroelectric Project, including Sugar Hill Reservoir (a.k.a. Goshen Dam), Sucker Brook Diversion Dam, Silver Lake, Dutton Brook downstream of the Sucker Brook Diversion, and Sucker Brook including all tributaries.</p>	A1	A1	A1	A1	A1	A1	B2	B2	1/15/17	Refer to Map 1 and Map 2
<p><b>Brandy Brook.</b> Emergency – Middlebury College Breadloaf Campus (WSID 20866) water source. Brandy Brook and all waters within its watershed.</p>	A2	A2	A2	A2	A2	A2	A2	B2	11/13/61	1.0 mile
<p><b>Unnamed tributary to Beaver Meadow Brook.</b> Abandoned – Village of Bristol water source. Unnamed tributary to Beaver Meadow Brook and all waters within its watershed upstream of the water intake in Lincoln.</p>	A2	A2	A2	A2	A2	A2	A2	B2	11/13/61	1.3 miles
<p><b>Unnamed tributary to Lewis Creek.</b> Abandoned – Village of Starksboro water source. Unnamed tributary to Lewis Creek and all waters within its watershed in Starksboro upstream of the water intake.</p>	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	2.0 miles

<b>Two unnamed tributaries to Little Otter Creek.</b> Abandoned – City of Vergennes water source. Two unnamed tributaries to Little Otter Creek and all waters within their watersheds in Monkton and Bristol upstream of two water intakes.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.6 miles and 1.4 miles
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Notch Brook.</b> Abandoned – Village of Middlebury water source. Notch Brook and all waters within its watershed upstream of the water intake in Bristol.	A2	A2	A2	A2	A2	A2	A2	B2	11/13/61	2.0 miles
<b>Roaring Brook.</b> Emergency – Wallingford Village (WSID 5242) water source. Roaring Brook and all waters within its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	3.3 miles
<b>Northern Lake Champlain (Basin 5)</b>										
<b>Lake Champlain including Minor Tributaries</b>										
<b>Milton Pond.</b> Abandoned – Village of Milton water source. Milton Pond and all waters within its watershed in Milton.	A2	A2	A2	A2	A2	A2	A2	B2	3/21/68	20 acres (Pond only)
<b>Indian Brook Reservoir.</b> Abandoned – Essex Town water source. Indian Brook Reservoir and all waters within its watershed in Essex Town.	A2	A2	A2	A2	A2	A2	A2	B2	3/21/68	95 acres (Reservoir only)

<b>Colchester Pond.</b> Abandoned – Village of Colchester water source. Colchester Pond and all waters within its watershed in the Town of Colchester.	A2	A2	A2	A2	A2	A2	A2	B2	3/21/68	93 acres (Pond only)
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>St. Albans Bay</b>										
<b>Mill River.</b> Permanent – City of St. Albans (WSID 5130) water source. Two reservoirs which drain to the Mill River and all waters within their watersheds in the Towns of Fairfax, St. Albans, and Fairfield. Locally known as Fairfax Reservoir.	A2	A2	A2	A2	A2	A2	A2	B2	6/28/54	62 acres (Reservoir only)
<b>Missisquoi (Basin 6)</b>										
<b>Missisquoi River</b>										
<b>Mountain Brook and tributary.</b> Abandoned – Village of North Troy water source. Mountain Brook and a tributary and all waters within their watersheds upstream of two separate water intakes in Jay.	A2	A2	A2	A2	A2	A2	A2	B2	5/28/70	1.6 miles and 1.1 miles
<b>Coburn Brook Reservoir and tributaries.</b> Abandoned – Village of Troy water source. Coburn Brook and Coburn Brook Reservoir in Westfield and all waters within their watersheds upstream of the water intake in Coburn Brook.	A2	A2	A2	A2	A2	A2	A2	B2	5/28/70	2.0 miles

<b>Unnamed tributary to Trout River.</b> Abandoned – Village of East Berkshire water source. Unnamed tributary to the Trout River in Enosburg and all waters within its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	5/28/70	0.6 mile
<b>Hannah Clark Brook.</b> Abandoned – Village of Montgomery Center water source. Hannah Clark Brook in Montgomery and all waters in its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	5/28/70	4.0 miles
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Stanhope Brook.</b> Permanent – Village of Richford (WSID 5216) water source. Stanhope Brook in Richford and all waters in its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	5/28/70	5.0 miles
<b>Trout Brook.</b> Abandoned – Village of Enosburg Falls water source. Trout Brook in Berkshire and all waters within its watershed upstream of the outlet of Enosburg Reservoir.	A2	A2	A2	A2	A2	A2	A2	B2	5/28/70	2.0 miles
<b>Loveland Brook.</b> Emergency – Village of Richford (WSID 5126) water source. Loveland Brook in Richford and all waters within its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	2.0 miles
<b>Black Falls Brook.</b> Abandoned – Village of Montgomery Center water source. Black Falls Brook in Montgomery and Richford and all waters within its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	5.0 miles
<b>Lamoille (Basin 7)</b>										
<b>Lamoille River</b>										

<b>Smith Brook.</b> Abandoned – Village of Johnson water source. Smith Brook in Johnson and all waters in its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.6 miles
<b>French Hill Brook.</b> Emergency – Village of Johnson (WSID 5156) water source. French Hill Brook in Johnson and all waters in its watershed upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	2.4 miles
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Silver Lake.</b> Emergency – City of St. Albans (WSID 5130) water source. Silver Lake and all waters in its watershed in the Towns of Georgia and Fairfax.	A2	A2	A2	A2	A2	A2	A2	B2	2/13/70	30 acres (Lake only)
<b>Unnamed tributary to the Lamoille River.</b> Abandoned – Village of Hardwick water source. Unnamed tributary to the Lamoille River and all waters in its watershed in Hardwick upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.0 mile
<b>Unnamed tributary to the Lamoille River.</b> Abandoned – Village of Fairfax water source. Unnamed tributary to the Lamoille River and all waters in its watershed in Fairfax upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	0.1 mile
<b>Winooski (Basin 8)</b>										
<b>Lower Winooski River</b>										
<b>Unnamed tributary to Alder Brook.</b> Abandoned – Former water source for Winooski, Essex Center, Essex Junction, and Pinewood Manor. Unnamed tributary and all waters within its watershed in Essex.	A2	A2	A2	A2	A2	A2	A2	B2	6/6/69	0.4 mile

<b>Middle Winooski River</b>																			
*Surface waters of the Breadloaf Wilderness. All streams, lakes, and ponds located within the boundaries of the federally designated Breadloaf Wilderness Area of the Green Mountain National Forest.										A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 1
Appendix F. WATER QUALITY CLASSIFICATIONS Waters										Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
Unnamed tributaries to Thatcher Brook. Tyler Brook – Permanent; Merriam Brook – Permanent – Village of Waterbury (WSID 5284) water sources. Unnamed tributaries to Thatcher Brook (known locally as Tyler and Merriam Brooks) and all waters upstream of the intakes in Stowe.										A2	A2	A2	A2	A2	A2	A2	B2	5/14/63	2.5 miles
Unnamed tributary to the West Branch of the Little River. Abandoned – Village of Stowe water source. An unnamed tributary to the West Branch of the Little River and all waters within its watershed in Stowe to the water intake.										A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.3 miles
<b>Stevens Branch</b>																			
Martin Brook, Reservoir, and tributaries. Abandoned – City of Barre water source. Martin Brook in Williamstown and all waters within its watershed, including unnamed tributaries, to the water intake.										A2	A2	A2	A2	A2	A2	A2	B2	8/7/69	3.5 miles
Bolster Reservoir and tributaries. Abandoned – Old City of Barre water source. Bolster Reservoir in South Barre and all waters within										A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	2.0 acres (Reservoir) and 2.2 miles tributaries

its watershed including Bolster Reservoir Brook, Pecks Pond, and unnamed tributaries.										
Appendix F. WATER QUALITY CLASSIFICATIONS Waters	Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>Thurman W. Dix Reservoir, Lower Reservoir, and tributaries.</b> Orange Reservoir – Permanent; Dix Reservoir – Permanent – City of Barre (WSID 5254) water sources. Thurman W. Dix Reservoir, Lower Reservoir, and all waters within their watersheds in the Towns of Barre and Orange including Orange Brook, Nelson Brook, Nate Smith Brook, and unnamed tributaries.	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	119 acres and 9.9 miles
<b>Unnamed brook and tributaries.</b> Abandoned – Village of East Barre water source. Unnamed brook and tributaries in the Town of Barre and all waters within their watersheds to the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	1.4 miles
<b>Little John and Milne Quarries.</b> Abandoned – Village of East Barre water sources. Little John Quarry and Milne Quarries in Barre Town (located southwest of East Barre Village).	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	No record
<b>Consolidated Quarries.</b> Barclay Quarry – Permanent; Quarry Hole #1 – Permanent; Capital Quarry – Emergency – Websterville (WSID 5247) water sources. When Barclay Quarry is low and demand is high, water is pumped from Quarry Hole #1 directly into the Barclay Quarry. Barclay Quarry is also known as Jones Brothers Quarry.	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	No record
<b>Old Granite Quarry.</b> Abandoned – Town of Barre water source located south of Websterville. Locally known as Standard Quarry.	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	No record

<b>Berlin Pond.</b> Permanent – City of Montpelier (WSID 5272) water source. Berlin Pond upstream of the dam and all waters within its watershed in the Towns of Berlin, Northfield, and Williamstown. The dam is located 300’ downstream of where Paine Turnpike crosses the pond.	A2	A2	A2	A2	A2	A2	A2	B2	8/7/62	256 acres
Appendix F. WATER QUALITY CLASSIFICATIONS <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>White River (Basin 9)</b>										
<b>White River</b>										
<b>*Surface waters of the Breadloaf Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally designated Breadloaf Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 1 and Map 2
<b>*Surface waters of the Joseph Battell Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally designated Joseph Battell Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 2
<b>*Bingo Brook.</b> Bingo Brook and tributaries from headwaters downstream to the Green Mountain National Forest boundary above Kings Pond (Hancock/Rochester).	A1	A1	B2	A1	A1	B2	B2	B2	01/15/17	33.3 MILES
<b>*Smith Brook.</b> Smith Brook and tributaries from headwaters downstream to Rt. 73.	A1	A1	B2	B2	A1	B2	B2	B2	01/15/17	6.8 MILES
<b>*Beaver Meadows Ponds.</b> All ponds and tributaries, beginning from headwaters, and ending at outlet of downstream most pond.	A1	A1	B2	B2	B2	B2	B2	B2	01/15/17	1.5 MILES



<b>Farnsworth Brook.</b> Abandoned – Village of East Braintree water source. Farnsworth Brook and all waters within its watershed in the Town of Braintree upstream of the water intake.	A2	A2	A2	A2	A2	A2	A2	B2	12/28/77	2.0 miles
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Lake Casper and Lake John.</b> Lake Casper – Abandoned; Lake John – Permanent – Village of South Royalton (WSID 5330) water sources. Lake Casper and Lake John and all waters within their watersheds in the Town of Royalton. Water is pumped from the Carpenter Field infiltration gallery in the White River up to Lake John.	A2	A2	A2	A2	A2	A2	A2	B2	12/28/77	No record
<b>Ottauquechee, Black (Basins 10 &amp; 13)</b>										
<b>Ottauquechee River</b>										
<b>Spring and unnamed tributary to the Ottauquechee River.</b> Abandoned – Village of North Hartland water source. A spring and unnamed tributary to the Ottauquechee River and all waters within its watershed upstream of the water intake. The spring and brook are located approximately 1 mile north-northwest of North Hartland Village.	A2	A2	A2	A2	A2	A2	A2	B2	11/16/67	0.3 mile
<b>Cox, Vondell, and Carlton Hill Reservoirs.</b> Cox and Vondell – Emergency; Carlton Hill – Abandoned – Village of Woodstock (WSID 5342) water sources. Cox, Vondell, and Carlton Hill Reservoirs in the Town of Woodstock and all waters within their watersheds.	A2	A2	A2	A2	A2	A2	A2	B2	11/16/67	2.5 miles (Stream only)

<b>Grant Brook (off Jewell Brook).</b> Abandoned – Village of Ludlow water source. Grant Brook and all waters within its watershed upstream of the flood control dam.	A1	A1	A1	A1	A1	A1	A2	B2	3/30/66	3.2 miles
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Wright, Upper Hurricane, and Lower Hurricane Reservoirs.</b> Wright – Emergency; Hurricane – Abandoned – Hartford Town (WSID 5319) water sources. Wright, Upper Hurricane, and Lower Hurricane Reservoirs and all waters within their watersheds in the Town of Hartford.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	10.4 acres
<b>Black River</b>										
<b>Springfield Reservoir Brook.</b> Abandoned – Village of Springfield water source. Springfield Reservoir Brook and tributaries and all waters in its watershed upstream of Springfield Reservoir.	A2	A2	A2	A2	A2	A2	A2	B2	3/30/66	1.8 miles
<b>Springfield Reservoir and tributaries.</b> Abandoned – Village of Springfield water source. Springfield Reservoir all waters within its watershed.	A2	A2	A2	A2	A2	A2	A2	B2	3/30/66	9.8 acres
<b>Unnamed tributary to Mill Brook.</b> Abandoned – Village of Ascutney water source. Unnamed tributary to Mill Brook and all waters in its watershed above the water intake. The unnamed tributary is the first tributary to Mill Brook in the Town of Weathersfield.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.7 miles
<b>West, Williams, Saxtons (Basins 11 &amp; 13)</b>										

West, Williams, and Saxtons Rivers										
*Surface waters of the Peru Peak Wilderness. All streams, lakes, and ponds located within the boundaries of the federally designated Peru Peak Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 3
Appendix F. WATER QUALITY CLASSIFICATIONS Waters	Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
*Surface waters of the Robert T. Stafford White Rocks National Recreation Areas. All streams, lakes, and ponds located within the boundaries of the federally designated Robert T. Stafford White Rocks National Recreation Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 3
*Surface waters of the Lye Brook Wilderness. All streams, lakes, and ponds located within the boundaries of the federally designated Lye Brook Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 3
*Mount Tabor Brook. Mount Tabor Brook from headwaters in the Peru Peak Wilderness and Robert T. Stafford White Rocks National Recreation area, and tributaries, downstream to confluence with Utley Brook.	A1	A1	B2	B2	A1	B2	B2	B2	01/15/17	7.2 MILES
*Moses Pond. Moses Pond including upstream tributaries.	A1	A1	B2	B2	B2	B2	B2	B2	01/15/17	12 acres
Sunset Lake and Stickney Brook. Sunset Lake – Permanent; Stickney Brook – Permanent – Town of Brattleboro (WSID 5290) water source. Sunset Lake, Langlie Brook, Kelly Brook, and Stickney Brook and all waters in their watersheds above the water diversions in the Towns of Dummerston, Marlboro, Newfane, and Brattleboro.	A2	A2	A2	A2	A2	A2	A2	B2	7/26/78	3.0 sq. miles

(Also refer to the classification of Pleasant Valley Reservoir – Basin 13).											
<b>Styles Brook.</b> Abandoned – Stratton Corp. water source. Styles Brook and all waters in its watershed above the diversion to Styles Reservoir.	A2	A2	A2	A2	A2	A2	A2	B2	7/26/78	1.0 sq. mile	
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>	
<b>Chester Reservoir and the outlet stream above the water intake.</b> Emergency – Village of Chester (WSID 5318) water source. Chester Reservoir, the outlet stream above the water intake, and all waters within their watersheds in the Town of Chester. The water intake is approximately 0.3 mile below the reservoir. Locally known as Pierce Brook Reservoir.	A2	A2	A2	A2	A2	A2	A2	B2	7/26/78	1.0 sq. mile	
<b>Bolles Brook (renamed Signal Hill Brook in 2016 by the Vermont Department of Libraries).</b> Emergency – Vermont Academy (WSID 5303) water source. Abandoned – Village of Saxtons River. Bolles/Bowles Pond Brook (now Signal Hill Brook) and all waters in its watershed above the water intake in the Town of Rockingham.	A2	A2	A2	A2	A2	A2	A2	B2	7/26/78	1.0 sq. mile	
<b>Kidder Brook and tributaries.</b> That portion of Kidder Brook and all its headwaters, including named and unnamed tributaries, beginning in the Town of Stratton at an elevation of 2,500 feet and continuing downstream to its confluence with the North Branch in the Town of Jamaica.	A1	A1	A1	A1	A1	A1	B2	B2	10/11/89	2.5 miles	
	A1	A1	A1	A1	A1	A1	B2	B2	10/09/91	6.0 miles	

<p><b>Cobb Brook.</b> That portion of Cobb Brook and its tributaries beginning in the Town of Windham at an elevation of 2,500 feet and continuing downstream to its confluence with the West River in the Town of Jamaica.</p>										
<p>Appendix F. WATER QUALITY CLASSIFICATIONS Waters</p>	<p>Aq. Biota</p>	<p>Aq. Habitat</p>	<p>Aesthetics</p>	<p>Boating</p>	<p>Fishing</p>	<p>Swimming</p>	<p>Public WS</p>	<p>Irrigation</p>	<p>Date</p>	<p>Approx. Miles/Acres</p>
<p><b>Upper Reach of the Winhall River.</b> That portion of the upper reach of the Winhall River including the river's two principal headwaters, beginning at an elevation of 2,500' in the Town of Stratton, and continuing downstream a distance of approximately 7.4 miles to the point at which the river crosses the current boundary of the Green Mountain National Forest in the Town of Winhall.</p>	<p>A1</p>	<p>A1</p>	<p>A1</p>	<p>A1</p>	<p>A1</p>	<p>A1</p>	<p>B2</p>	<p>B2</p>	<p>10/09/91</p>	<p>7.4 miles</p>
<p><b>Back Pond/Minards Pond.</b> Permanent – Village of Bellows Falls (WSID 5298) water source. Back Pond and all water within its watershed, which is diverted to Minards Pond. Back Pond is located 0.1 mile northwest of Minards Pond in the Town of Rockingham.</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>B2</p>	<p>3/21/68</p>	<p>2.0 acres</p>
<p><b>Ellis Brook.</b> Permanent – Village of Bellows Falls (WSID 5298) water source. Ellis Brook and all waters in its watershed above the water intake, which is situated at elev. 715' MSL in the Town of Rockingham.</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>B2</p>	<p>7/1/71</p>	<p>246 acres (watershed)</p>
<p><b>Farr Brook.</b> Permanent – Village of Bellows Falls (WSID 5298) water source. Farr Brook and all waters in its watershed above the water intake, which is located at elev. 710' MSL in the Town of Rockingham.</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>A2</p>	<p>B2</p>	<p>7/1/71</p>	<p>154 acres (watershed)</p>

<b>Mill Brook.</b> Emergency – Kurn Hattin School (WSID 5452) water source. Mill Brook and all water within its watershed above the water intake in the Town of Westminster. The intake is located approximately 1.0 miles upstream of its confluence with the Connecticut River.	A2	A2	A2	A2	A2	A2	A2	B2	3/21/68	3.0 miles
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Deerfield (Basins 12 &amp; 13)</b>										
<b>Deerfield River</b>										
<b>*Surface waters of the Glastenbury Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally designated Glastenbury Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 4
<b>*Surface waters of the George D. Aiken Wilderness.</b> All streams, lakes, and ponds located within the boundaries of the federally designated George D. Aiken Wilderness Area of the Green Mountain National Forest.	A1	A1	A1	A1	A1	A1	B2	B2	01/15/17	Refer to Map 4
<b>*Upper Deerfield River.</b> Deerfield River and tributaries beginning upstream of the confluence of the Rake Branch watershed, including the Castle Brook and Glastenbury River watersheds.	A1	A1	B2	B2	A1	B2	B2	B2	01/15/17	88.7 miles
<b>*Stamford Pond.</b> Stamford Pond and upstream tributaries.	A1	A1	B2	B2	B2	B2	B2	B2	01/15/17	12 acres

<b>Haystack Pond.</b> Permanent – Village of Wilmington (WSID 5310) water source. Haystack Pond and all waters within its watershed in the Town of Wilmington.	A2	A2	A2	A2	A2	A2	A2	B2	1/27/61	36 acres
Appendix F. WATER QUALITY CLASSIFICATIONS <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Howe Pond and Howe Pond Brook.</b> Permanent – Village of Readsboro (WSID 5028) water source. Howe Pond and all waters within its watershed. Howe Pond Brook and all waters within its watershed above the water intake, which is located approximately 1.1 miles downstream from Howe Pond. Both pond and brook are located in the Town of Readsboro.	A2	A2	A2	A2	A2	A2	A2	B2	1/27/61	62 acres
<b>Cold Brook and tributaries.</b> That portion of Cold Brook and its tributaries between an elevation of 2,500 feet and continuing downstream to its confluence with Mountain Brook in the Town of Dover.	A1	A1	A1	A1	A1	A1	B2	B2	10/7/96	1.5 miles
<b>Pleasant Valley Reservoir.</b> Permanent – Town of Brattleboro (WSID 5290) water source. Pleasant Valley Reservoir and all waters in its watershed in the Town of Brattleboro. Langlie, Kelly, and Stickney Brook diversions send their waters to Pleasant Valley Reservoir. (Also refer to the classification of Sunset Lake & Stickney Brook – Basin 11)	A2	A2	A2	A2	A2	A2	A2	B2	3/21/68	25 acres
<b>Stevens, Wells, Waits, Ompompanoosuc (Basins 14 &amp; 16)</b>										

<b>Mill Pond Brook.</b> Abandoned – Village of Bradford water source. Mill Pond Brook and all waters within its watershed above the intake dam in the Towns of Fairlee, Bradford, and West Fairlee. Locally known as the Brushwood Impoundment.	A2	A2	A2	A2	A2	A2	A2	B2	2/19/60	3.0 miles
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Artificial impoundment on South Peacham Hollow Brook.</b> Abandoned – Peacham water source. An artificial impoundment on South Peacham Hollow Brook, and all waters within its watershed above the intake. The impoundment is located approximately 1/2 mile east of Fosters Road in the Town of Peacham.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	No record
<b>Charles Brown Brook.</b> Abandoned – Village of Norwich water source. Charles Brown Brook and all waters within its watershed above the water intake in the Town of Norwich.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	2.5 miles
<b>Unnamed tributary to Connecticut River.</b> Emergency – Village of Newbury (WSID 5175) water source. An unnamed tributary to the Connecticut River and all waters within its watershed above the water intake in the Town of Newbury. The tributary is approximately one mile south of Pulaski Mountain. The intake is located approximately 0.7 mile upstream of its confluence with the Connecticut River.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.0 mile
<b>Unnamed tributary to Lake Morey.</b> Abandoned – Village of Fairlee water source. An unnamed tributary to Lake Morey and all	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	1.1 miles



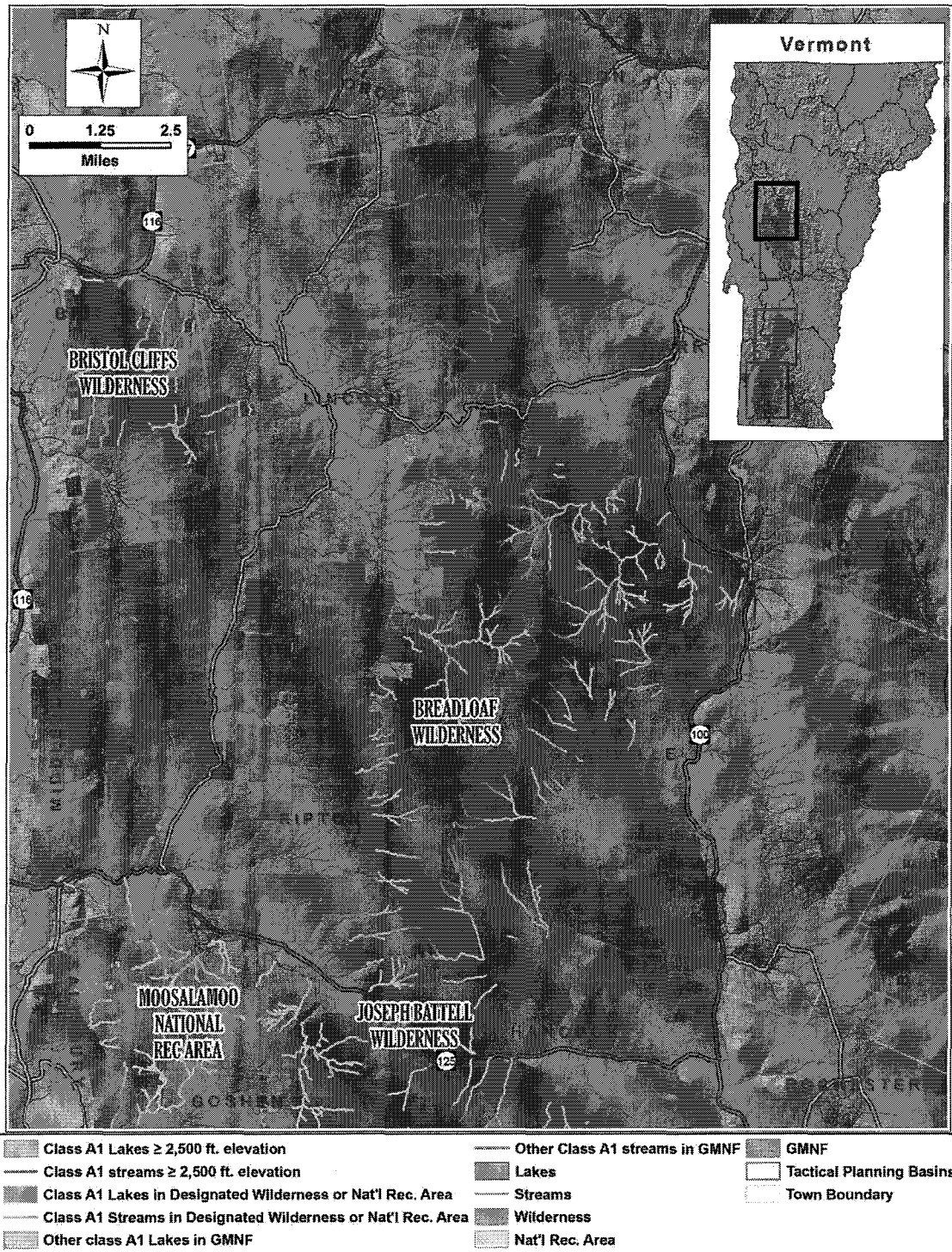
waters in its watershed in the Town of Fairlee to the water intake dam, including a man-made impoundment.											
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>	
<b>Passumpsic (Basin 15)</b>											
<b>Passumpsic River</b>											
<b>Unnamed tributary to Miller Run including Mathewson Reservoir.</b> Abandoned – Village of Lyndonville water source. Unnamed tributary to Miller Run including Mathewson Reservoir and all waters within their watersheds above the intake in the Towns of Lyndon and Sutton.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	1.5 miles	
<b>Unnamed tributary to Miller Run including Copeland Reservoir.</b> Abandoned – Village of Lyndonville water source. Unnamed tributary to Miller Run including Copeland Reservoir and all waters within their watersheds above the intake in the Towns of Lyndon and Sutton.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	1.5 miles	
<b>Two unnamed tributaries to Sutton River.</b> Abandoned – Unknown water source. Two unnamed tributaries to the Sutton River, near West Burke, and all waters within their watersheds above the intakes.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	0.8 mile	

<b>Chandler Pond.</b> Abandoned – Lyndonville Village water source. Chandler Pond and all waters within its watershed in the Town of Wheelock. Wheelock Pond drains to the South Wheelock Branch.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	59 acres
<b>Woodworth Reservoir.</b> Abandoned – Lyndonville water source. Woodworth Reservoir and all waters within its watershed in the Town of Lyndon. Woodworth Reservoir flows to the South Wheelock Branch.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	No record
<b>Appendix F. WATER QUALITY CLASSIFICATIONS</b> <b>Waters</b>	<b>Aq. Biota</b>	<b>Aq. Habitat</b>	<b>Aesthetics</b>	<b>Boating</b>	<b>Fishing</b>	<b>Swimming</b>	<b>Public WS</b>	<b>Irrigation</b>	<b>Date</b>	<b>Approx. Miles/Acres</b>
<b>Stiles Pond.</b> Permanent – St. Johnsbury Village (WSID 5045) water source. Stiles Pond and all waters within its watershed in the Town of Waterford. Stiles Pond is in the St. Johnsbury municipal forest and flows to the Moose River.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	5.5 miles and 146 acres (Stiles Pond)
<b>Danville Reservoir.</b> Emergency – Danville (WSID 5037) water source. Danville Reservoir on tributary of Brown Brook and all waters within its watershed in Danville.	A2	A2	A2	A2	A2	A2	A2	B2	4/28/76	2.0 miles
<b>Upper Connecticut, Nulhegan, Willard Stream, Paul Stream (Basin 16)</b>										
<b>Unnamed tributary to Connecticut River.</b> Abandoned – Village of Bloomfield water source. An unnamed tributary to the Connecticut River and all waters within its watershed above the water intake in the Town of Bloomfield. The intake is approximately 0.5 mile above “Basin Hole.”	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	0.2 mile
<b>Lake Memphremagog, Black, Barton, Clyde, Coaticock (Basin 17)</b>										

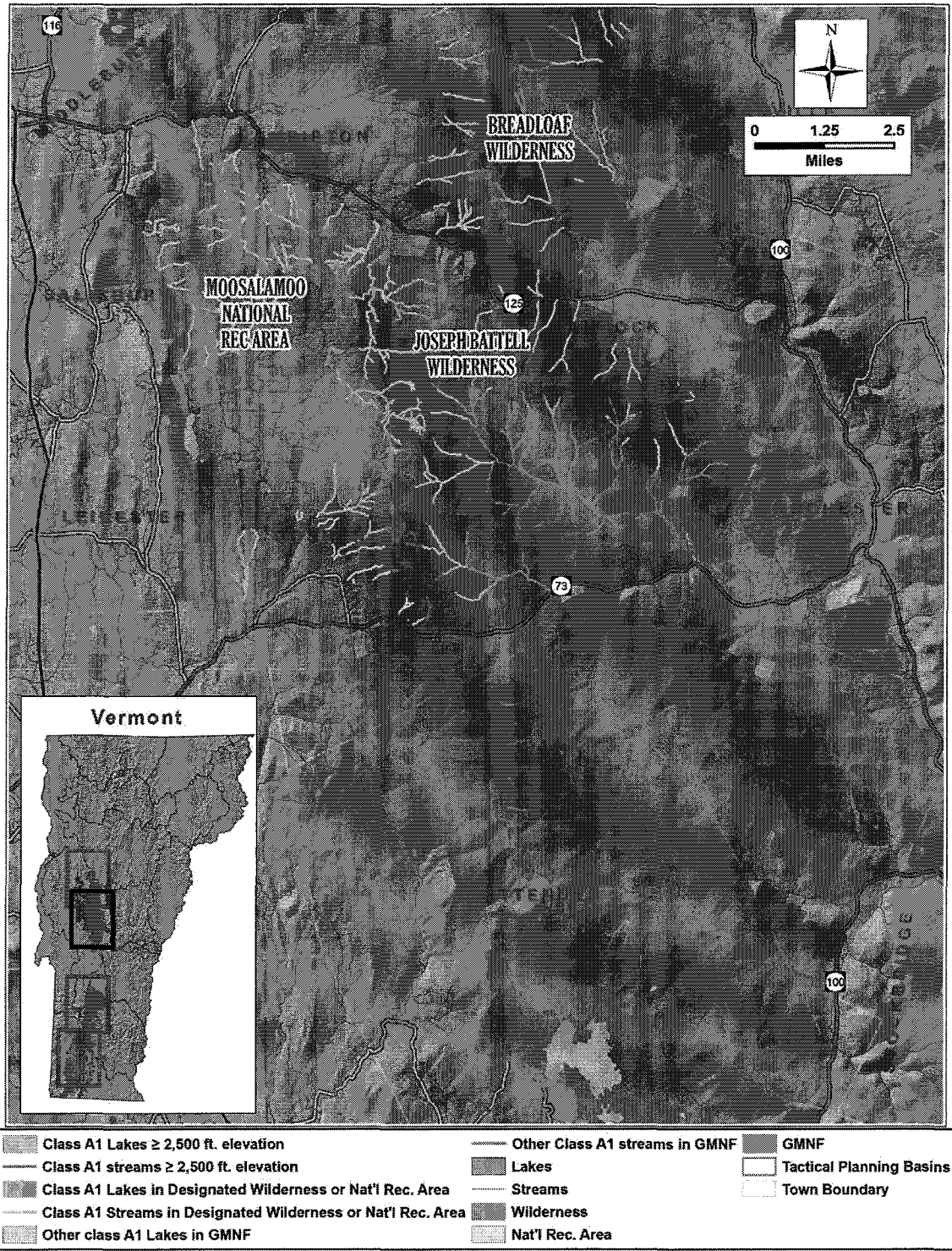
<b>Lake Memphremagog and International Stream</b>										
<b>Unnamed reservoir near Derby Line.</b> Reservoir and all waters in its watershed in the Town of Derby.	A2	A2	A2	A2	A2	A2	A2	B2	7/1/71	No record
Appendix F. WATER QUALITY CLASSIFICATIONS Waters	Aq. Biota	Aq. Habitat	Aesthetics	Boating	Fishing	Swimming	Public WS	Irrigation	Date	Approx. Miles/Acres
<b>May Pond Brook and May Pond.</b> Permanent – Village of Barton (WSID 5189) water source. May Pond Brook and all waters within its watershed in the Town of Barton above and including the water source reservoir and May Pond. The reservoir is located approximately ¾ mile upstream of the brook’s confluence with Crystal Lake.	A2	A2	A2	A2	A2	A2	A2	B2	10/30/87	13 acres
<b>Black, Barton, Clyde Rivers</b>										
<b>Unnamed tributary to the Black River.</b> Abandoned – Coventry water source. An unnamed tributary to the Black River and all waters within its watershed above the water intake in the Town of Coventry.	A2	A2	A2	A2	A2	A2	A2	B2	2/20/75	1.0 mile
<b>Unnamed tributary to Island Pond.</b> Permanent – Town of Brighton (WSID 5105) water source. An unnamed tributary to Island Pond and all waters within its watershed in the Town of Brighton above the water intake at approx. elev. of 1544.0’ MSL. The tributary flows northerly to Island Pond. Locally known as Brook #1.	A2	A2	A2	A2	A2	A2	A2	B2	2/20/75	1.0 mile
<b>Unnamed tributary to Lightning Brook.</b> Permanent – Town of Brighton (WSID 5105) water source. Two unnamed tributaries to an unnamed tributary to Lightning Brook and all waters in their watersheds in the Town of Brighton above the intakes. The main	A2	A2	A2	A2	A2	A2	A2	B2	2/20/75	2.0 miles

intake is at approx. elev. 1526.0' MSL, and the upper, more northerly intake is diverted to the main intake. Locally known as Brook #2.

--	--	--	--	--	--	--	--	--	--	--

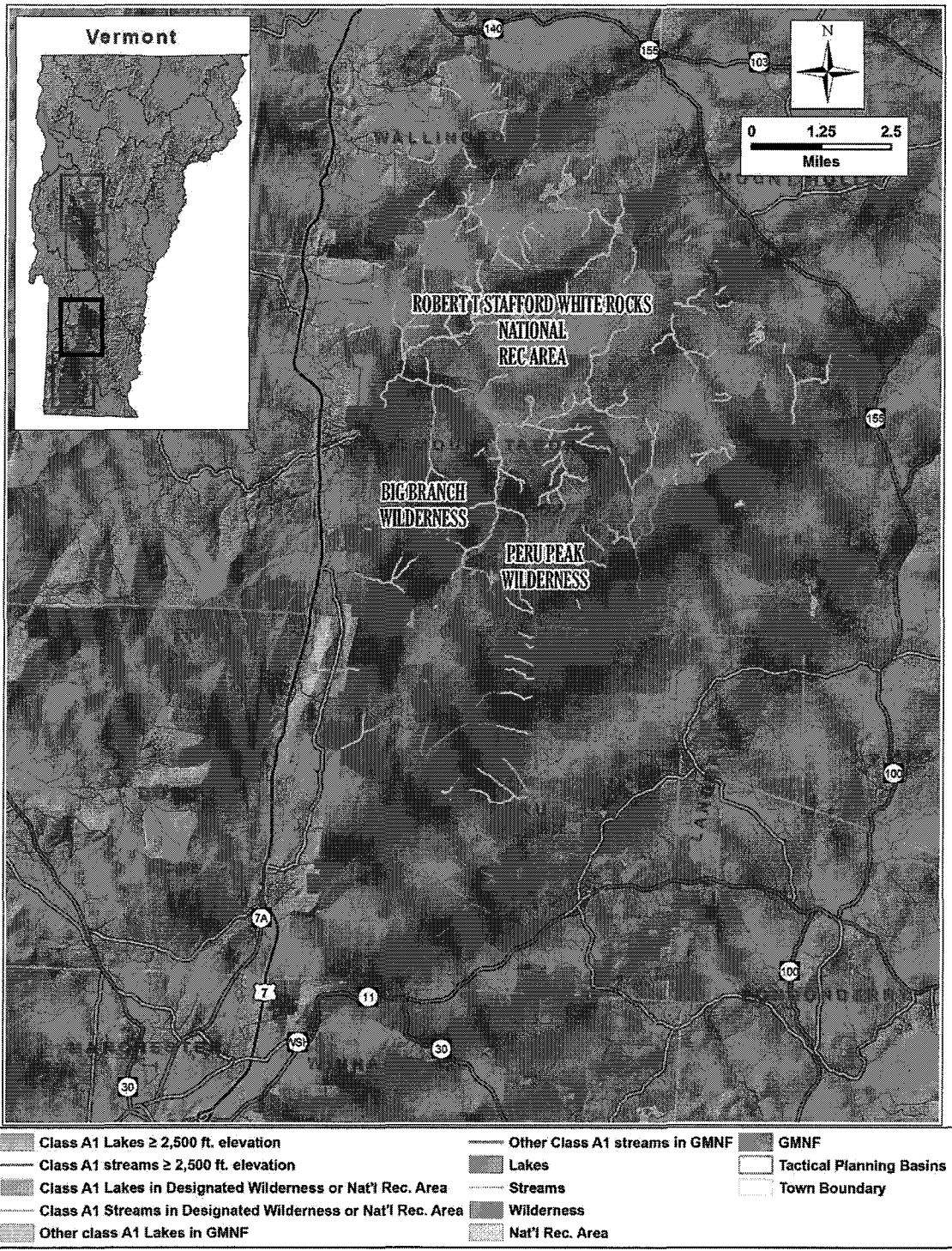


Map 1. Class A(1) surface waters in the Green Mountain National Forest – Breadloaf Area.  
 Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A



Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A

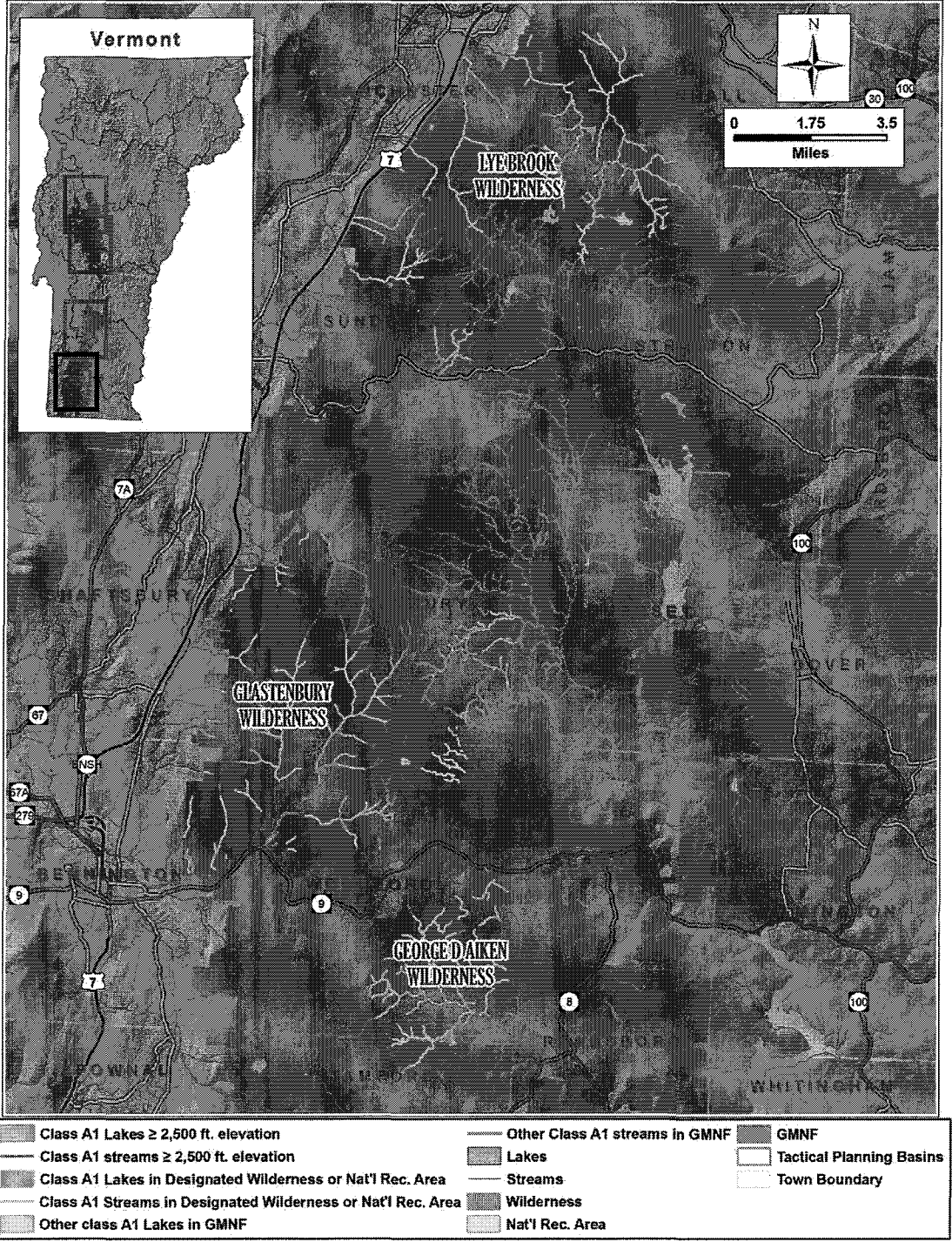
Map 2. Class A(1) surface waters in the Green Mountain National Forest, Moosalamoo, and Battell Areas.



Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A



Map 3. Class A(1) surface waters in the Green Mountain National Forest – White Rocks/Big Branch/Peru Areas.



Map 4. Class A(1) surface waters in the Green Mountain National Forest – Lye Brook and Glastenbury areas.

Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A

## Appendix G. APPLICATION OF BIOCRITERIA FOR FISH AND MACROINVERTEBRATE COMMUNITIES IN VERMONT WADEABLE STREAMS AND RIVERS

### Introduction

Section 29A-305 of this rule states that the Secretary shall establish and apply numeric biological indexes to determine whether there is support of the aquatic biota use for each class of water. This appendix incorporates into these rules procedures for the collection and analysis of fish and aquatic macroinvertebrate community data used to determine compliance with the class-specific narrative criteria included in § 29A-306(a) of these rules.

Community metrics and Indexes of Biotic Integrity (IBI) have been developed expressly for Vermont wadeable rivers and streams to measure the biological integrity of each community. High biological integrity corresponds to a high degree of similarity to the natural condition. The natural condition was determined for each stream type by analyzing fish and macroinvertebrate community structure and function from Vermont waters least affected by human activities. In order of increasing departure from the natural condition of fish and macroinvertebrate communities, waters are categorized as Excellent – Class A(1), Very Good – Class B(1), and Good – Class (B2)<sup>3</sup>. Guidance on this appendix is provided on the Department’s website at: <http://dec.vermont.gov/watershed/map/monitor/biomonitoring>.

### Macroinvertebrate Community Biocriteria

*Macroinvertebrate Community Types.* Stream macroinvertebrate community types are largely differentiated based on streambed gradient, which dictates substrate coarseness. Moderate to high gradient streams are dominated by gravel to boulder size material, while low gradient streams are dominated by silt and sand bottoms. Three community types have been identified from moderate and high gradient riffle habitats and are differentiated largely on site drainage area and elevation. They are “Small High Gradient (SHG),” “Medium High Gradient (MHG),” and “Warm Water Moderate Gradient (WWMG).” Two low gradient communities are differentiated by habitat characteristics in sand and silt dominated streams. They are “Hybrid Low Gradient (HLG),” and “Slow Low Gradient (SLG)” respectively. Community types are assessed with different combinations of biological criteria and different scales of metric scoring. Community metrics are assessed *independently* for the three moderate and high gradient (riffle habitat) community types. The two low gradient community types are assessed using Indexes of Biotic Integrity (IBIs), in which individual metric scores are summed to produce a *single index value*.

*Macroinvertebrate Community Sampling Methods.* The macroinvertebrate biocriteria are applicable to wadeable streams. For moderate and high gradient communities, a bottom kick-net shall be used to sample four representative riffle habitats from a given stream reach. The four sub-samples shall be composited into a single sample. For low gradient communities, a sample shall consist of a

---

<sup>3</sup> For waters in which the aquatic biota and wildlife use is classified as A(2), the metrics for Class B(2) waters shall apply.

Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A

composite of four kick-net sweeps or jabs into woody debris, root wads, macrophytes and or submerged stream-side vegetation.

Samples shall be preserved in the field and processed in the lab to remove macroinvertebrates from plant and mineral detritus. A minimum of 25% of the sample shall be processed to ensure accurate community metric calculations. If 300 organisms are not removed in the initial 25% subsample, the subsample size shall be incrementally expanded until a minimum of 300 organisms are removed. All macroinvertebrates removed shall be identified by taxonomists to the lowest practical level, with a target level of genus or species for most organisms.

### **Medium and High Gradient “Riffle Habitat” Macroinvertebrate Metrics**

The biological integrity of macroinvertebrate communities in moderate to high gradient streams shall be evaluated using an independent multi-metric scoring system calibrated for each of the three stream community types: SHG, MHG, and WWMG (Tables A-1, A-2, and A-3). Threshold values for each community type have been established for each metric that correspond to increasing levels of departure from the natural condition. In a site assessment, the metric or metrics with the greatest departure from natural condition (lowest level of quality) shall be used to assign the community to a level of biological integrity ranging from Poor to Excellent.

*Scoring Community Data.* Each threshold metric value identifies a level of biological integrity: Excellent, Very Good, Good, or failing to fully support aquatic biota (Fair or Poor). Metric values from a macroinvertebrate community assessment that fall within a specified range immediately below a threshold indicate an “indeterminate” finding for that metric being intermediate between that level and the next lower level.

An assessment of metric values consists of a systematic comparison of each value against threshold criteria for each level, beginning with Excellent, using the following procedure:

- (1) The biological integrity of the community shall achieve classification criteria A(1), B(1), or B(2) when all metrics are at or above the threshold for that class.
- (2) When one or more metrics fall below the threshold “indeterminate” range, all metric values shall be compared to the next lower level of biological integrity until (1) above is met.
- (3) If neither (1) nor (2) above are met, an “indeterminate” finding shall be made for that assessment. An indeterminate finding shall result in a transitional assessment rating between the level the site is indeterminate for and the one immediately below that (e.g. Fair/Good or Good/Very Good).
- (4) An outcome for a single metric may be adjusted upward or downward if it is documented by the biologist that the metric value is not representative of the macroinvertebrate community. For example, this could be due to an unusual hyper-dominance of a taxon in its early stages of development.

Table A-1. Metrics for Small High Gradient (SHG) macroinvertebrate communities.

SHG Metric		Biological Integrity		
		Excellent A(1)	Very Good B(1)	Good B(2)
<b>Total density (number per square meter)</b>	<i>Threshold:</i>	<b>500</b>	<b>400</b>	<b>300</b>
	<i>Indeterminate range:</i>	(450-<500)	(350-<400)	(250-<300)
<b>Total richness of all unique taxa</b>	<i>Threshold:</i>	<b>35</b>	<b>31</b>	<b>27</b>
	<i>Indeterminate range:</i>	(34-<35)	(30-<31)	(26-<27)
<b>Richness of Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa</b>	<i>Threshold:</i>	<b>21</b>	<b>19</b>	<b>16</b>
	<i>Indeterminate range:</i>	(20-<21)	(18-<19)	(15-<16)
<b>Ratio of EPT individuals to EPT plus Chironomidae individuals</b>	<i>Threshold:</i>	<b>0.65</b>	<b>0.55</b>	<b>0.45</b>
	<i>Indeterminate range:</i>	(0.63-<0.65)	(0.53-<0.55)	(0.43-<0.45)
<b>Percent model affinity of orders (PMA-O)</b>	<i>Threshold:</i>	<b>65</b>	<b>55</b>	<b>45</b>
	<i>Indeterminate range:</i>	(60-<65)	(50-<55)	(40-<45)
<b>Percent of individuals as Oligochaeta</b>	<i>Threshold:</i>	<b>2.0</b>	<b>5.0</b>	<b>12.0</b>
	<i>Indeterminate range:</i>	(>2.0-3.0)	(>5.0-6.5)	(>12.0-14.5)
<b>Hilsenhoff Biotic Index value</b>	<i>Threshold:</i>	<b>3.00</b>	<b>3.50</b>	<b>4.50</b>
	<i>Indeterminate range:</i>	(>3.00-3.30)	(>3.50-3.65)	(>4.50-4.65)
<b>Pinkham-Pearson Coefficient of similarity of functional groups (PPCS-F)</b>	<i>Threshold:</i>	<b>0.50</b>	<b>0.45</b>	<b>0.40</b>
	<i>Indeterminate range:</i>	(0.45-<0.50)	(0.40-<0.45)	(0.35-<0.40)

Table A- 2. Metrics for Medium High Gradient (MHG) macroinvertebrate communities.

MHG Metric		Biological Integrity		
		Excellent A(1)	Very Good B(1)	Good B(2)
<b>Total density (number per square meter)</b>	<i>Threshold:</i>	<b>500</b>	<b>400</b>	<b>300</b>
	<i>Indeterminate range:</i>	(450-<500)	(350-<400)	(250-<300)
<b>Total richness of all unique taxa</b>	<i>Threshold:</i>	<b>43</b>	<b>39</b>	<b>30</b>
	<i>Indeterminate range:</i>	(41-<43)	(37-<39)	(28-<30)
<b>Richness of Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa</b>	<i>Threshold:</i>	<b>24</b>	<b>22</b>	<b>18</b>
	<i>Indeterminate range:</i>	(22-<24)	(20-<22)	(16-<18)
<b>Ratio of EPT individuals to EPT plus Chironomidae individuals</b>	<i>Threshold:</i>	<b>0.65</b>	<b>0.55</b>	<b>0.45</b>
	<i>Indeterminate range:</i>	(0.63-<0.65)	(0.53-<0.55)	(0.43-<0.45)
<b>Percent model affinity of orders (PMA-O)</b>	<i>Threshold:</i>	<b>65</b>	<b>55</b>	<b>45</b>
	<i>Indeterminate range:</i>	(60-<65)	(50-<55)	(40-<45)
<b>Percent of individuals as Oligochaeta</b>	<i>Threshold:</i>	<b>2.0</b>	<b>5.0</b>	<b>12.0</b>
	<i>Indeterminate range:</i>	(>2.0-3.0)	(>5.0-6.5)	(>12.0-14.5)
<b>Hilsenhoff Biotic Index value</b>	<i>Threshold:</i>	<b>3.50</b>	<b>4.00</b>	<b>5.00</b>
	<i>Indeterminate range:</i>	(>3.50-3.80)	(>4.00-4.15)	(>5.00-5.15)
<b>Pinkham-Pearson coefficient of similarity of functional groups (PPCS-F)</b>	<i>Threshold:</i>	<b>0.50</b>	<b>0.45</b>	<b>0.40</b>
	<i>Indeterminate range:</i>	(0.45-<0.50)	(0.40-<0.45)	(0.35-<0.40)

Table A-3. Metrics for Warm Water Moderate Gradient (WWMG) macroinvertebrate communities.

WWMG Metric		Biological Integrity		
		Excellent A(1)	Very Good B(1)	Good B(2)
<b>Total density (number per square meter)</b>	<i>Threshold:</i>	<b>500</b>	<b>400</b>	<b>300</b>
	<i>Indeterminate range:</i>	(450-<500)	(350-<400)	(250-<300)
<b>Total richness of all unique taxa</b>	<i>Threshold:</i>	<b>40</b>	<b>35</b>	<b>30</b>
	<i>Indeterminate range:</i>	(38-<40)	(33-<35)	(28-<30)
<b>Richness of Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa</b>	<i>Threshold:</i>	<b>21</b>	<b>19</b>	<b>16</b>
	<i>Indeterminate range:</i>	(20-<21)	(18-<19)	(15-<16)
<b>Ratio of EPT individuals to EPT plus Chironomidae individuals</b>	<i>Threshold:</i>	<b>0.65</b>	<b>0.55</b>	<b>0.45</b>
	<i>Indeterminate range:</i>	(0.63-<0.65)	(0.53-<0.55)	(0.43-<0.45)
<b>Percent model affinity of orders (PMA-O)</b>	<i>Threshold:</i>	<b>65</b>	<b>55</b>	<b>45</b>
	<i>Indeterminate range:</i>	(60-<65)	(50-<55)	(40-<45)
<b>Percent of individuals as Oligochaeta</b>	<i>Threshold:</i>	<b>2.0</b>	<b>5.0</b>	<b>12.0</b>
	<i>Indeterminate range:</i>	(>2.0-3.0)	(>5.0-6.5)	(>12.0-14.5)
<b>Hilsenhoff Biotic Index value</b>	<i>Threshold:</i>	<b>4.25</b>	<b>4.75</b>	<b>5.40</b>
	<i>Indeterminate range:</i>	(>4.25-4.40)	(>4.75-4.90)	(>5.40-5.65)
<b>Pinkham-Pearson coefficient of similarity of functional groups (PPCS-F)</b>	<i>Threshold:</i>	<b>0.50</b>	<b>0.45</b>	<b>0.40</b>
	<i>Indeterminate range:</i>	(0.45-<0.50)	(0.40-<0.45)	(0.35-<0.40)

### **Low Gradient Macroinvertebrate IBIs**

Two IBIs shall be used to assess the two macroinvertebrate community types in low gradient streams (Tables A-4 and A-5). The IBIs for Slow Low Gradient (SLG) or Hybrid Low Gradient (HLG) community types contain ten metrics, with each metric scored with a value from one to five. A value of one corresponds with Poor, indicating the most departure from natural condition. A value of five corresponds with Excellent, indicating similarity to the natural condition. Table A-6 shows IBI scores with corresponding levels of biological integrity and water classification.

An initial IBI score shall be calculated by summing all individual metric scores, which results in a range of 10-50. The final IBI score shall be determined by applying the following steps:

- (1) If the initial IBI score is less than 29, then score as shown in Table A-6.
- (2) If the score is equal to or more than 29, then proceed to (3) below.
- (3) If metric 1, or metrics 2 and 3, or any four metrics score a "1" or "2", then score community a 28 (Fair).
- (4) Determinations for any assessment level on Table A-6 may be adjusted upward or downward if it is documented by the biologist that the finding is not representative of the macroinvertebrate community.



Table A-4. IBI metrics for Hybrid Low Gradient (HLG) macroinvertebrate communities.

HLG Metric	Score				
	5	4	3	2	1
<b>1. Total Density (number per sample)</b>	≥ 500	400-<500	300-<400	200-<300	< 200
<b>2. Richness of Ephemeroptera, Odonata, and Trichoptera (EOT) taxa</b>	≥ 15	13-<15	11-<13	7-<11	< 7
<b>3. Richness of intolerant taxa, based on Biological Condition Gradient (BCG) attribute scores 1-3</b>	≥ 14	11-<14	9-<11	5-<8	< 5
<b>4. Percent of individuals as intolerant Coleoptera, Odonata, Trichoptera, and Ephemeroptera (COTE), based on BCG scores 1-3</b>	≥ 28	20-<28	13-<20	5-<13	< 5
<b>5. Ratio<sup>1</sup> of EOT individuals to EOT plus Chironomidae individuals</b>	≥ 0.50	0.38-<0.50	0.26-<0.38	0.13-<0.26	< 0.13
<b>6. Percent model affinity of orders (PMA-O)</b>	≥ 75	65-<75	55-<65	45-<55	< 45
<b>7. Percent of individuals as Amphipoda and Isopoda (excluding the genus <i>Hyallolella</i>)</b>	0	>0-1	>1-5	>5-25	> 25
<b>8. Hilsenhoff Biotic Index value</b>	< 4.0	4.0-<5.0	5.0-<6.0	6.0-<6.5	≥ 6.5
<b>9. Pinkham-Pearson coefficient of similarity of functional groups (PPCS-F)</b>	≥ 0.57	0.49-<0.57	0.41-<0.49	0.36-<0.41	< 0.36
<b>10. Ratio of individuals as shredders to individuals as shredder and collector-filterers</b>	≥ 0.50	0.35-<0.50	0.20-<0.35	0.10-<0.20	< 0.10

<sup>1</sup>These metrics exclude individuals in the families Baetidae (Ephemeroptera) and Hydropsychidae (Trichoptera).

Table A-5. IBI metrics for Slow Low Gradient (SLG) macroinvertebrate communities.

SLG Metric	Score				
	5	4	3	2	1
1. Total Density (number per sample)	≥ 500	400-<500	300-<400	200-<300	< 200
2. Richness of Ephemeroptera, Odonata, and Trichoptera (EOT) taxa	≥ 15	11-<15	8-<11	5-<8	< 5
3. Richness of intolerant taxa, based on Biological Condition Gradient (BCG) attribute scores 1-3	≥ 10	7-<10	5-<7	2-<5	< 2
4. Percent of individuals as intolerant Coleoptera, Odonata, Trichoptera, and Ephemeroptera (COTE) based on BCG scores 1-3	≥ 20	14-<20	9-<14	3-<8	< 3
5. Ratio <sup>1</sup> of EOT individuals to EOT plus Chironomidae individuals	≥ 0.50	0.36-<0.50	0.23-<0.35	0.11-<0.22	< 0.11
6. Percent model affinity of orders (PMA-O)	≥ 65	57-<65	50-<57	40-<50	< 40
7. Percent of individuals as Amphipoda and Isopoda (excluding the genus <i>Hyallela</i> )	0	>0-1	>1-5	>5-25	> 25
8. Hilsenhoff Biotic Index value	< 5.5	5.5-<6.0	6.0-<6.5	6.5-<7.0	≥ 7.0
9. Pinkham-Pearson coefficient of similarity of functional groups (PPCS-F)	≥ 0.50	0.42-<0.50	0.34-<0.42	0.29-0.34	< 0.29
10. EOT <sup>1</sup> Density (number per square meter)	≥ 500	351-<500	200-<350	100-<200	< 100

<sup>1</sup> These metrics exclude individuals in the families Baetidae (Ephemeroptera) and Hydropsychidae (Trichoptera).

Table A-6. IBI Assessment Scale for low gradient streams.

Class Equivalent and Assessment	IBI Range
A(1) Excellent: <i>Indeterminate range (Very Good/Excellent):</i>	46-50 (44-45)
B(1) Very Good: <i>Indeterminate range (Good/Very Good):</i>	39-43 (37-38)
B(2) Good: <i>Indeterminate range (Fair/Good):</i>	31-36 (29-30)
Fair: <i>Indeterminate range (Poor/Fair):</i>	21-28 (19-20)
Poor:	10-18

## Fish Community Biocriteria

*Fish Community Indexes of Biotic Integrity (IBI).* The health or biological integrity of fish communities in wadeable, hard bottomed Vermont streams shall be evaluated by one of two IBIs, the Cold Water IBI (CWIBI) or the Mixed Water IBI (MWIBI). These two IBIs measure the extent of departure of the fish community from the natural condition. The CWIBI is used to assess the biological integrity of cold water, hard bottom streams that support two to four native species. The CWIBI is comprised of six metrics, with each metric having a possible score of 1.5 (Poor) to 7.5 (Excellent). The MWIBI is used to assess the biological integrity of both warm water and cold water, hard bottom streams that support five or more native fish species. The MWIBI is comprised of nine metrics, each having a possible score of 1 (Poor) to 5 (Excellent). In applying the two IBIs, each metric is scored and then summed to produce a final score. Final scores for both IBIs range from 9 (Poor) to 45 (Excellent). Assessment scores that are within 2 points of the next highest or next lowest rating may be placed into that next highest or lower level by the biologist. Extenuating factors considered in making these determinations may include metric values that show dramatically higher or lower values, the proportion of the community composed of nonnative fish species, and species dominance.

*Fish Community Sampling Methods.* Fish are collected using one or more backpack electrofishers. A sample shall be taken from a section of stream representative of the habitat present in the overall stream reach and shall be long enough to provide a reliable sample. The minimum section length to be fished in wadeable streams shall be 75 meters and increases with mean section width (Table A-7). When mean river widths exceed 12 meters, sampled area shall be reduced to the area from both banks out to approximately 6 meters. An IBI shall be calculated from a single electrofishing run. Where density is of particular concern, two to three runs shall be conducted, and a population estimate shall be calculated; when second run catch density exceeds 50% of first run, a third run shall be performed. Individual fish captured during the electrofishing run shall be enumerated by species, and the count of deformities, fin erosion, and lesions or tumor anomalies shall be noted for each species.

Table A-7. Minimum section lengths for sampling fish communities in wadeable streams based on wetted width.

Mean Wetted Width (meters)	<3.5	3.5-<5	5-<8	8-<12 <sup>1</sup>	≥12 <sup>1</sup>
Minimum Section Length Sampled (meters)	75	100	120	150	150-200

<sup>1</sup> May include from banks out to 6 meters, shocked only.

**MWIBI**

Table A-8. Mixed Water Index of Biotic Integrity. Scoring procedure for Metric 1 is presented in Figures A-1 and A-2. See Table A-9 for additional scoring procedures for metrics 2, 3, 6, 7, and 9.

MWIBI Metric	Score				
	5	4	3	2	1
<b>1. Total number of native fish species</b>	Maximum Species Richness Line				
<b>2. Number and identity of native intolerant species</b> <i>statewide, except for &lt; 400 ft. elevation in Champlain drainage</i>	>1	-	1	-	0
<i>&lt; 400 ft. elevation in Champlain drainage</i>	1	-	-	-	0
<b>3. Number and identity of native benthic insectivores</b>	>1	-	1	-	0
<b>4. Proportion of individuals as White Sucker and Creek Chub</b>	<11%	11-<18	18-<26	26-33	>33
<b>5. Proportion of individuals as native and nonnative generalist feeders</b> <i>statewide except for &lt; 500 ft. elevation in Champlain drainage</i>	<20%	20-<28	28-<36	36-45	>45
<i>&lt; 500 ft. elevation in Champlain drainage</i>	<30%	30-<40	40-<50	50-60	>60
<b>6. Proportion of individuals as native water column and benthic insectivores</b> <i>statewide, except &lt; 500 feet elevation in Champlain drainage</i>	>65%	54-65	43-<54	31-<43	<31
<i>&lt; 500 feet elevation in Champlain drainage</i>	>55%	44-55	32-<44	20-<32	<20
<b>7. Proportion of individuals as native top carnivores</b> <i>cold water population (include nonnative salmonids)</i>	>15%	11-15	8-<11	5-<8	<5
<i>warm water population (if drainage at sample site is &lt;25km<sup>2</sup> then score 5)</i>	>10%	9-10	7-<9	3-<7	<3
<b>8. Proportion of sample with deformities, fin erosion, lesions or tumors</b>	<1%	1-<2	2-<3	3-4	>4
<b>9. Abundance<sup>1</sup> of native species (#/100m<sup>2</sup>)</b> <i>&lt;500 ft. elevation in Champlain drainage</i>	>20	-	10-20	-	<10
<i>All other sites statewide: site alkalinity &gt;9 mg/l</i>	>10	-	7-10	-	<7
<i>site alkalinity &lt;9 mg/l</i>	>6	-	3-6	-	<3

<sup>1</sup> Nonnative trout are included in metric 9.

Figure A-1. This Maximum Species Richness Line (MSRL) shall be used for scoring the native species richness metric in the MWIBI for sample sites above 500 feet in elevation and all sites in the Connecticut River watershed. A metric score of 1-5 is achieved by the visual intersection of the site drainage area (km<sup>2</sup>) with the number of native species collected.

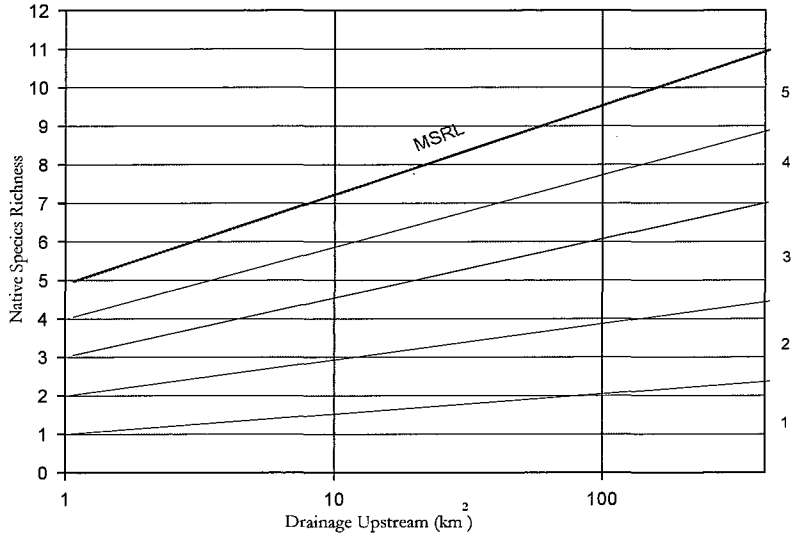


Figure A-2. This MSRL shall be used for scoring the native species richness metric in the MWIBI for sample sites below 500 feet in the St. Lawrence River watershed. A metric score of 1-5 is achieved by the visual intersection of the site drainage area with the number of native species collected.

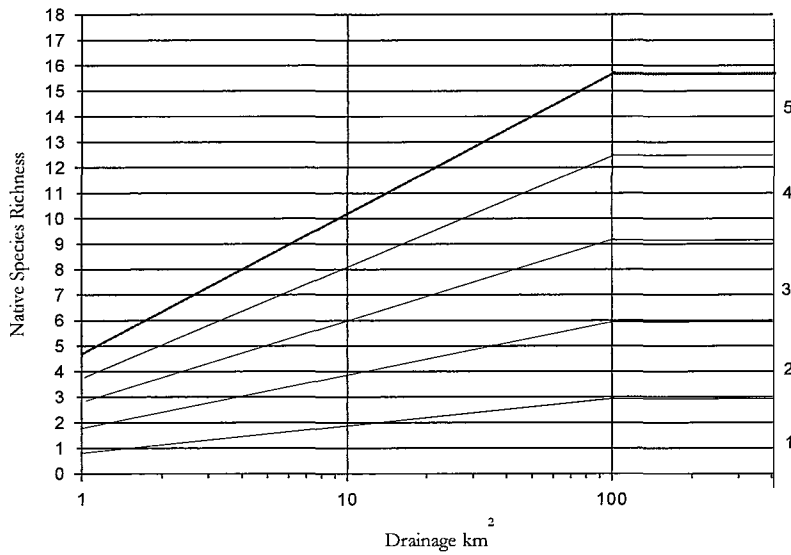


Table A-9. Scoring procedure for MWIBI metrics 2, 3, 6, 7, and 9.

Metric 2 (< 400 ft. elevation)	(1) If one species represented by two or more individuals OR two species represented by one fish each, then score <b>5</b> . (2) If one species represented by one individual, then score <b>3</b> . (3) If no species, then score <b>1</b> .
Metric 2 (> 400 ft. elevation) and Metric 3	(1) If two or more species represented by two or more individuals each, then score <b>5</b> ; (2) If two species, one represented by two or more individuals and the other represented by one individual, then score <b>4</b> ; (3) If one species represented by two or more individuals OR two species represented by one fish each, then score <b>3</b> ; (4) If one species represented by one individual, then score <b>2</b> ; or (5) If no species, then score <b>1</b> .
Metric 6	If proportion of Blacknose Dace exceeds 55% of total sample or if the only insectivore, then score <b>1</b> .
Metric 7	A cold-water fish community is a community that naturally supports one or more of the following species: Brook Trout, Slimy Sculpin, Longnose Sucker, or Burbot.
Metric 9	If less than 20 individuals collected in sample, then score metrics 4-8 as <b>1</b> .

Table A-10. MWIBI Assessment Scale.

Class Equivalent and Assessment	IBI Range	Score	Biological Integrity	Class Equivalent
A(1) Excellent	41-45	41-45	Excellent	A(1)
B(1) Very Good	36-40	36-40	Very Good	B(1)
B(2) Good	30-35	30-35	Good	B(2)
Fair	27-29	27-29	Fair	Non-Support
Poor	<27	<27	Poor	Non-Support

**CWIBI**

Table A-11. Cold Water Index of Biotic Integrity. Scoring rules for metrics 1, 2, 3, and 4 shown in Table A-12.

CWIBI Metric	Score				
	7.5	6	4.5	3	1.5
1. Number of native, intolerant species	2	-	1	-	0
2. Proportion of sample as cold water stenothermic species	> 75%	67-75	59-<67	50-<59	< 50
3. Proportion of individuals as generalist feeders	< 5%	5-7	>7-10	>10-13	> 13
4. Proportion of individuals as top carnivores	> 35%	32-35	29-<32	25-<29	< 25
5. Brook Trout density (#/100 m <sup>2</sup> from first electrofishing pass)	>4.0	-	2.0-4.0	-	<2.0
6. Brook Trout age class structure	YOY <sup>1</sup> and adults present	-	YOY only, no adults	-	YOY and adults absent

<sup>1</sup> Young of Year.

Table A-12. Metric scoring rules for CWIBI

For Metric 1	1) If two species represented by two or more individuals, then score <b>7.5</b> ; 2) If two species, one represented by two or more individuals and a second represented by one individual, then score <b>6</b> ; 3) If one species represented by two or more fish OR two species represented by one individual each, then score <b>4.5</b> ; 4) If species represented by one individual, then score <b>3</b> ; or 5) If no intolerant species, then score <b>1.5</b> .
For Metrics 2, 3, and 4	1) If less than 20 individuals in sample, then score <b>1.5</b> .

Table A-13. CWIBI Assessment Scale.

Score	Biological Integrity	Class Equivalent
41-45	Excellent	A(1)
36-40	Very Good	B(1)
30-35	Good	B(2)
27-29	Fair	Non-Support
<27	Poor	Non-Support

## Appendix H. OUTSTANDING RESOURCE WATERS

1. **Batten Kill**, Towns of East Dorset and Arlington. Designated June 12, 1991. The main stem of the Batten Kill from its headwaters in East Dorset and the West Branch to the New York border at Arlington, Vermont, a distance of approximately 26 miles. Designated on the basis of exceptional natural, recreational, cultural, and scenic values.
2. **Pike's Falls/Ball Mountain**, Town of Jamaica. Designated June 21, 1991. A portion of the North Branch between the point where Kidder Brook enters the brook above Pike's Falls to the point below the falls where an unnamed tributary, which originates from the Winhall Municipal Forest, enters the North Branch. This segment is approximately 4,000 feet in length and within this distance the stream descends 140 feet, much of the drop occurring within Pike's Falls. Designated on the basis of exceptional natural, recreational, and scenic values.
3. **Poultney River**, Towns of Poultney and Fair Haven. Designated June 28, 1991. The lower portion of the Poultney River beginning at the Poultney/Fair Haven town line and continuing downstream to its confluence with Lake Champlain. Designated on the basis of exceptional natural, cultural, and scenic values.
4. **Great Falls, Ompompanoosuc River**, Town of Thetford. Designated March 6, 1996. That portion of the Ompompanoosuc between its confluence with a tributary draining both Gillette Swamp and Mud Pond, also known as Forsyth Pond, and its confluence with the West Branch, 3.8 miles downstream in the Town of Thetford. Designated on the basis of exceptional recreational, cultural, scenic, and natural values.



VERMONT **GENERAL ASSEMBLY**

# The Vermont Statutes Online

## Title 10 : Conservation And Development

### Chapter 047 : Water Pollution Control

#### Subchapter 001 : Water Pollution Control

(Cite as: 10 V.S.A. § 1251a)

#### § 1251a. Water pollution administration

(a) The Secretary may adopt rules, in accordance with the procedures in the Administrative Procedure Act, that are necessary for the proper administration of the Secretary's duties under this subchapter, including a planning process approvable under Public Law 92-500, as amended.

(b) The Secretary shall establish by rule requirements for the issuance of permits under subsection 1259(e) of this title, including in-stream water quality parameters necessary to establish permit conditions and performance monitoring; however, these in-stream water quality parameters shall not supersede water quality standards adopted by the Secretary.

(c) On or before July 1, 2016, the Secretary of Natural Resources shall adopt by rule an implementation process for the antidegradation policy in the water quality standards of the State. The implementation process for the antidegradation policy shall be consistent with the State water quality policy established in section 1250 of this title, the Vermont Water Quality Standards, and any applicable requirements of the federal Clean Water Act. The Secretary of Natural Resources shall apply the antidegradation implementation policy to all new discharges that require a permit under this chapter. (Added 1981, No. 222 (Adj. Sess.), § 25; amended 1985, No. 199 (Adj. Sess.), § 4, eff. May 17, 1986; 1989, No. 64, § 2, eff. May 24, 1989; 1997, No. 155 (Adj. Sess.), § 34; 2003, No. 115 (Adj. Sess.), § 25, eff. Jan. 31, 2005; 2007, No. 43, § 6a, eff. May 23, 2007; 2011, No. 138 (Adj. Sess.), § 27, eff. May 14, 2012; 2015, No. 64, § 30.)

VERMONT **GENERAL ASSEMBLY**

# The Vermont Statutes Online

## Title 10 : Conservation And Development

### Chapter 047 : Water Pollution Control

#### Subchapter 001 : Water Pollution Control

(Cite as: 10 V.S.A. § 1252)

#### § 1252. Classification of high quality waters; mixing zones

(a) The State adopts, for the purposes of individually classifying the uses of its high quality waters, the following classes and definitions:

Class A(1): Waters in a natural condition that have significant ecological value;

Class A(2): Waters that are suitable for a public water source with filtration and disinfection or other required treatment; character uniformly excellent.

Class B(1): Waters in which one or more uses are of demonstrably and consistently higher quality than Class B(2) waters; or

Class B(2): Waters that are suitable for swimming and other primary contact recreation; irrigation and agricultural uses; aquatic biota and aquatic habitat; good aesthetic value; boating, fishing, and other recreational uses and suitable for public water source with filtration and disinfection or other required treatment.

(b) The Secretary may establish mixing zones or waste management zones as necessary in the issuance of a permit in accordance with this section and criteria established by rule. Those waters authorized under this chapter, as of July 1, 1992, to receive the direct discharge of wastes that prior to treatment contained organisms pathogenic to human beings are designated waste management zones for those discharges. Those waters that as of July 1, 1992 are Class C waters into which no direct discharge of wastes that prior to treatment contained organisms pathogenic to human beings is authorized, shall become waste management zones for any municipality in which the waters are located that qualifies for a discharge permit under this chapter for those wastes prior to July 1, 1997.

(c) Upon issuance or renewal of any discharge permit, subsequent to July 1, 1992, involving a discharge into a waste management zone created pursuant to subsection (b) of this section, the Secretary shall adjust the size of the waste management zone to the extent necessary to accommodate the authorized discharge.

(d) Prior to the initial authorization of a new waste management zone, except those created pursuant to subsection (b) of this section, or prior to the expansion of the size of

an existing zone created under this section, in order to accommodate an increased discharge, the Secretary shall:

(1) Prepare a draft permit which includes a description of the proposed waste management zone and proceed in accordance with subsections 7713(c), (d), and (e) of this title.

(2) Give due consideration to the cumulative impact of overlapping waste management zones.

(3) Determine that the creation or expansion of such a waste management zone is in the public interest after giving due consideration to the factors specified in subdivisions 1253(e)(1) through (10) of this title.

(4) Determine that the creation or expansion of such a zone will not:

(A) create a public health hazard; or

(B) constitute a barrier to the passage or migration of fish or result in an undue adverse effect on fish, aquatic biota, or wildlife; or

(C) interfere with those uses that have actually occurred on or after November 28, 1975, in or on a water body, whether or not the uses are included in the standard for classification of the particular water body; or

(D) be inconsistent with the anti-degradation policy in the water quality standards.

(5) Provide a written explanation with respect to subdivisions (2) through (4) of this subsection.

(e) The Secretary shall adopt standards of water quality to achieve the purposes of the water classifications. Such standards shall be expressed in detailed water quality criteria, taking into account the available data and the effect of these criteria on existing activities, using as appropriate: (1) numerical values, (2) biological parameters; and (3) narrative descriptions. These standards shall establish limits for at least the following: alkalinity, ammonia, chlorine, fecal coliform, color, nitrates, oil and grease, dissolved oxygen, pH, phosphorus, temperature, all toxic substances for which the U.S. Environmental Protection Agency has established criteria values, and any other water quality parameters deemed necessary by the Board.

(f) The Secretary may issue declaratory rulings regarding these standards.

(g) Notwithstanding the provisions of subsection 1259(c) of this title and rules implementing that subsection, the Secretary may issue a discharge permit pursuant to section 1263 of this title, for a municipal discharge of treated municipal waste into Class B waters, if that municipal discharge was established prior to January 1, 1974 and was, as of January 1, 1990, occurring pursuant to authorization contained in an assurance of discontinuance.

(h) A discharge permit issued pursuant to subsection (g) of this section may not authorize an increase in mass pollutant loading beyond that contained in the assurance of discontinuance. (Amended 1961, No. 101; 1964, No. 37 (Sp. Sess.), § 3; 1967, No. 181, § 1, eff. April 17, 1967; 1973, No. 103, § 3, eff. April 24, 1973; 1981, No. 222 (Adj. Sess.), § 25; 1985, No. 199 (Adj. Sess.), § 5, eff. May 17, 1986; 1989, No. 278 (Adj. Sess.), § 5; 1991, No. 211 (Adj. Sess.), § 2; 2011, No. 138 (Adj. Sess.), § 21, eff. May 14, 2012; 2015, No. 79 (Adj. Sess.), § 1, eff. April 28, 2016; 2015, No. 150 (Adj. Sess.), § 15, eff. Jan. 1, 2018.)



# Proposed Rules Postings

## A Service of the Office of the Secretary of State

- [Vermont.gov](#)
- [Feedback](#)
- [SOS Website](#)
- [APA Site](#)
- [Code of Vermont Rules](#)
- [Recent](#)
- [Search Rules](#)
- [Calendar](#)
- [Subscribe](#)
- [APA Contact Info](#)

### Search Rules

### Deadline For Public Comment

Deadline: Jul 22, 2022

The deadline for public comment has expired. Contact the agency or primary contact person listed below for assistance.

### Rule Details

Rule Number:	22P009
Title:	Vermont Water Quality Standards.
Type:	Standard
Status:	Proposed
Agency:	Agency of Natural Resources
Legal Authority:	10 V.S.A. §§ 1251a and 1252(e).
Summary:	The Vermont Water Quality Standards (WQS) are being amended to clarify applicability of the Standards, reflect updates to policy related to streamflow and stream processes, update water quality criteria for consistency with federal standards, and reflect changes enacted under Act 32

of 2021. Amendments to the Rule include: 1. Language regarding the application of the Standards to wetlands; 2. Language articulating the requirements of state certifications issued pursuant to Section 401 of the CWA; 3. Update to aquatic biota-based criteria clarifying that 30Q10 flows apply for chronic criteria that utilize a 30-day average; 4. Updates to methodology associated with determining hydrology criteria; 5. Updates to methodology associated with numeric biological indices and aquatic habitat assessments; 6. Updates to the Management Objectives and Criteria; 7. Reclassification of three A(1) streams in the Lower Otter Creek Watershed; 8. Changes to Appendix C, including updates to aluminum and copper criteria.

Persons Affected:

State and federal agencies and departments, particularly the Agency of Natural Resources; the Vermont Agency of Agriculture, Food & Markets; the Vermont Agency of Transportation; and the Vermont Agency of Human Services, Department of Health. These agencies and departments work in partnership to implement the WQS. Municipalities with permits requiring compliance with the WQS. Private enterprises, businesses, and individual citizens whose operations, development, or land-use activities require a permit or certification to ensure compliance with the WQS. Broadly, residents of the State of Vermont, who derive economic and public health benefits from the maintenance of surface waters in such condition that their designated uses may be realized.

Economic Impact:

The amendments regarding the application of the Rule to wetlands, consistent with Act 32, are expected to have negligible economic impact because they are intended to clarify existing policy. Amendments regarding the requirements associated with 401 Water Quality Certifications, consistent with Act 32, are expected to have a negligible economic impact because information regarding project alternatives is typically provided as a component of an application for a federal license or permit. Changes to criteria, including aquatic habitat assessments, are expected to have negligible economic impact because they clarify the evaluation methods currently used. Amendments to Appendix C may have an impact on Wastewater Treatment Facility (WWTF) operators required to implement new technology to meet the standards. Landowners within the watersheds of the reclassified A(1) waters must comply with restrictions on the discharge of

wastes to those waters, which may nominally impact the development potential of their property.

Posting date: May 25,2022

## Hearing Information

### Information for Hearing # 1

Hearing date: 07-12-2022 6:00 PM [ADD TO YOUR CALENDAR](#)

Location: ANR Annex Building

Address: 190 Junction Road

City: Berlin

State: VT

Zip: 05602

Hearing Notes:

## Contact Information

### Information for Primary Contact

**PRIMARY CONTACT PERSON - A PERSON WHO IS ABLE TO ANSWER QUESTIONS ABOUT THE CONTENT OF THE RULE.**

Level: Primary

Name: Bethany Sargent

Agency: Department of Environmental Conservation, Agency of Natural Resources

Address: 1 National Life Drive, Davis 3

City: Montpelier

State: VT

Zip: 05620-3522

Telephone: 802-490-6131

Fax: 802-828-1544

Email: [bethany.sargent@vermont.gov](mailto:bethany.sargent@vermont.gov)

[SEND A COMMENT](#)

Website Address: <https://dec.vermont.gov/watershed/>

[VIEW WEBSITE](#)

### Information for Secondary Contact

**SECONDARY CONTACT PERSON - A SPECIFIC PERSON FROM WHOM COPIES OF FILINGS MAY BE REQUESTED OR WHO MAY ANSWER QUESTIONS ABOUT FORMS SUBMITTED FOR FILING IF DIFFERENT FROM THE PRIMARY CONTACT PERSON.**

Level: Secondary  
Name: Hannah Smithq  
Agency: Agency of Natural Resources  
Address: 1 National Life Drive, Davis 2  
City: Montpelier  
State: VT  
Zip: 05620-3522  
Telephone: 802-461-8187  
Fax: 802-828-1544  
Email: hannah.smith@vermont.gov

[SEND A COMMENT](#)

## Keyword Information

Keywords:

Water Quality Standards  
Vermont Water Quality Standards  
WQS  
Antidegradation  
Section 401  
Water Quality Certification  
Hydrology criteria  
Water quality criteria  
Water quality classification

[Back](#)

[Accessibility Policy](#) | [Privacy Policy](#)

A Vermont Government Website Copyright 2022 State of Vermont



v 1.0.2



OFFICE OF THE SECRETARY OF STATE  
VERMONT STATE ARCHIVES & RECORDS ADMINISTRATION (VSARA)  
(802) 828-2863

---

<b>TO:</b> Seven Days Katie Hodges ( <a href="mailto:khodges@sevendaysvt.com">khodges@sevendaysvt.com</a> ) Legals	Tel: (802) 865-1020 x110.
The Caledonian Record Julie Poutré ( <a href="mailto:adv@caledonian-record.com">adv@caledonian-record.com</a> )	Tel: 748-8121 FAX: 748-1613
Times Argus / Rutland Herald Melody Hudson ( <a href="mailto:classified.ads@rutlandherald.com">classified.ads@rutlandherald.com</a> ) Elizabeth Marrier <a href="mailto:elizabeth.marrier@rutlandherald.com">elizabeth.marrier@rutlandherald.com</a> )	Tel: 802-747-6121 ext 2238 FAX: 802-776-5600
The Valley News ( <a href="mailto:advertising@vnews.com">advertising@vnews.com</a> )	Tel: 603-298-8711 FAX: 603-298-0212
The Addison Independent ( <a href="mailto:legals@addisonindependent.com">legals@addisonindependent.com</a> )	Tel: 388-4944 FAX: 388-3100 Attn: Display Advertising
The Bennington Banner / Brattleboro Reformer Lylah Wright ( <a href="mailto:lwright@reformer.com">lwright@reformer.com</a> )	Tel: 254-2311 ext. 132 FAX: 447-2028 Attn: Lylah Wright
The Chronicle ( <a href="mailto:ads@bartonchronicle.com">ads@bartonchronicle.com</a> )	Tel: 525-3531 FAX: 525-3200
Herald of Randolph ( <a href="mailto:ads@ourherald.com">ads@ourherald.com</a> )	Tel: 728-3232 FAX: 728-9275 Attn: Brandi Comette
Newport Daily Express ( <a href="mailto:jlafae@newportvermontdailyexpress.com">jlafae@newportvermontdailyexpress.com</a> )	Tel: 334-6568 FAX: 334-6891 Attn: Jon Lafoe
News & Citizen ( <a href="mailto:mike@stowereporter.com">mike@stowereporter.com</a> ) Irene Nuzzo ( <a href="mailto:irene@newsandcitizen.com">irene@newsandcitizen.com</a> and <a href="mailto:ads@stowereporter.com">ads@stowereporter.com</a> removed from distribution list per Lisa Stearns.	Tel: 888-2212 FAX: 888-2173 Attn: Bryan
St. Albans Messenger Ben Letourneau ( <a href="mailto:ben.letourneau@samessenger.com">ben.letourneau@samessenger.com</a> )	Tel: 524-9771 ext. 117 FAX: 527-1948 Attn: Ben Letourneau
The Islander ( <a href="mailto:islander@vermontislander.com">islander@vermontislander.com</a> )	Tel: 802-372-5600 FAX: 802-372-3025
Vermont Lawyer ( <a href="mailto:hunter.press.vermont@gmail.com">hunter.press.vermont@gmail.com</a> )	Attn: Will Hunter

---

**FROM:** APA Coordinator, VSARA

**Date of Fax:** May 24, 2022

**RE:** The "Proposed State Rules " ad copy to run on

**June 2, 2022**

**PAGES INCLUDING THIS COVER MEMO:**

**2**

---

**\*NOTE\* 8-pt font in body. 12-pt font max. for headings - single space body. Please include dashed lines where they appear in ad copy. Otherwise minimize the use of white space. Exceptions require written approval.**

---

If you have questions, or if the printing schedule of your paper is disrupted by holiday etc. please contact VSARA at 802-828-3700, or E-Mail [sos.statutoryfilings@vermont.gov](mailto:sos.statutoryfilings@vermont.gov), Thanks.

## PROPOSED STATE RULES

---

By law, public notice of proposed rules must be given by publication in newspapers of record. The purpose of these notices is to give the public a chance to respond to the proposals. The public notices for administrative rules are now also available online at <https://secure.vermont.gov/SOS/rules/>. The law requires an agency to hold a public hearing on a proposed rule, if requested to do so in writing by 25 persons or an association having at least 25 members.

To make special arrangements for individuals with disabilities or special needs please call or write the contact person listed below as soon as possible.

To obtain further information concerning any scheduled hearing(s), obtain copies of proposed rule(s) or submit comments regarding proposed rule(s), please call or write the contact person listed below. You may also submit comments in writing to the Legislative Committee on Administrative Rules, State House, Montpelier, Vermont 05602 (802-828-2231).

---

Vermont Water Quality Standards.

Vermont Proposed Rule: 22P009

AGENCY: Agency of Natural Resources

CONCISE SUMMARY: The Vermont Water Quality Standards (WQS) are being amended to clarify applicability of the Standards, reflect updates to policy related to streamflow and stream processes, update water quality criteria for consistency with federal standards, and reflect changes enacted under Act 32 of 2021.

Amendments to the Rule include: 1. Language regarding the application of the Standards to wetlands; 2. Language articulating the requirements of state certifications issued pursuant to Section 401 of the CWA; 3. Update to aquatic biota-based criteria clarifying that 30Q10 flows apply for chronic criteria that utilize a 30-day average; 4. Updates to methodology associated with determining hydrology criteria; 5. Updates to methodology associated with numeric biological indices and aquatic habitat assessments; 6. Updates to the Management Objectives and Criteria; 7. Reclassification of three A(1) streams in the Lower Otter Creek Watershed; 8. Changes to Appendix C, including updates to aluminum and copper criteria.

FOR FURTHER INFORMATION, CONTACT: Bethany Sargent, DEC Monitoring and Assessment Program, Agency of Natural Resources 1 National Life Drive, Davis 3, Montpelier, VT 05620-3522 Tel: 802-490-6131 Fax: 802-828-1544 Email: [bethany.sargent@vermont.gov](mailto:bethany.sargent@vermont.gov) URL: <https://dec.vermont.gov/watershed/>.

FOR COPIES: Hannah Smith, Agency of Natural Resources 1 National Life Drive, Davis 2, Montpelier, VT 05620-3522 Tel: 802-461-8187 Fax: 802-828-1544 Email: [hannah.smith@vermont.gov](mailto:hannah.smith@vermont.gov).

---

Rule 2.000 Rules of Practice.

Vermont Proposed Rule: 22P010

AGENCY: Public Utility Commission

CONCISE SUMMARY: The Commission has not comprehensively revised its rules of practice in many years. The proposed rule will update the Commission's rules of practice to, among other things, (1) reflect the implementation of the Commission's electronic filing system, (2) more clearly identify the portions of the Vermont Rules of Civil Procedure that apply in Commission proceedings, (3) better facilitate public

participation by non-lawyers in Commission proceedings by incorporating all rules of procedure into a single source and clarifying their meaning and application, making it easier for public participants to understand what rules apply, and (4) incorporate certain procedural changes that were made on an emergency basis during the COVID-19 pandemic, including clarifying that the Commission may hold status conferences and hearings remotely (and allow remote participation even at in-person hearings) and that parties may file documents without notarization.

FOR FURTHER INFORMATION, CONTACT: Kyle Landis-Marinello, Esq. Vermont Public Utility Commission 112 State Street, 4th Fl., Montpelier, VT 05602 Tel: 802-828-1158 Fax: 802-828-3352 Email: [kyle.landis-marinello@vermont.gov](mailto:kyle.landis-marinello@vermont.gov) URL: <https://epuc.vermont.gov/?q=node/64/151626>.

FOR COPIES: John Cotter, Esq. Vermont Public Utility Commission 112 State Street, 4th Fl., Montpelier, VT 05602 Tel: 802-828-1161 Fax: 802-828-3352 Email: [john.cotter@vermont.gov](mailto:john.cotter@vermont.gov).

---