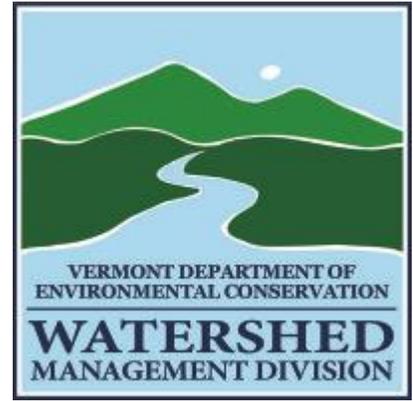


## 2014 Water Quality Standards Amendments Fact Sheet



The Watershed Management Division of the VT Department of Environmental Conservation (Division) has completed a review and update of the Vermont Water Quality Standards (Standards). This review, termed the “triennial review,” is required by the Clean Water Act. As the criteria in the Water Quality Standards have not been updated in many years, this review implements into State rule a broad set of changes in compliance with Federal guidance and statute.

### Amendments:

The amendments to the Standards consist of these components:

- 1) housekeeping changes associated with the transfer of rulemaking authority from the Natural Resources Board (NRB) to the Agency of Natural Resources (ANR) (e.g. replacing references to the NRB with references to ANR), pursuant to Act 138 of 2012, Sections 20-28;
- 2) revisions to the *E. coli* criteria for the protection of waters for swimming for consistency with the U.S. Environmental Protection Agency's (EPA) guidance under Section 304(a) of the federal Clean Water Act (CWA);
- 3) numerous technical revisions to toxic substances criteria contained within "Appendix C" of the current Rule, including the addition of criteria for chloride (de-icing salt) for consistency with EPA's guidance under Section 304(a) of the CWA;
- 4) the addition of a new phosphorus criteria framework for inland lakes and ponds and wadeable streams to comply with EPA's National Strategy for the Development of Regional Nutrient Criteria promulgated under Section 304(a) of the CWA.

### Documentation:

The revised Standards and associated technical supporting documentation may be found at: <http://www.vtwaterquality.org/rulemaking/htm/rules.htm>.

### Question and Answer:

#### ***Why did the State change the E. coli criteria?***

The *E. coli* bacteria measured in surface water is rarely in and of itself pathogenic. Rather, because *E. coli* is a normal component of the gut organisms of all warm-blooded animals, *E. coli* may indicate the presence of fecal material. When this is the case, the presence of *E. coli* may also indicate the presence of co-occurring pathogens. Sources of *E. coli* are many-fold: human; agricultural; pets; and, wildlife. While *E. coli* perishes in water, it can remain viable in sediments of lakes, wetlands,

and streams, and sediments themselves can be a source of *E. coli*. Such may not be the case for co-occurring pathogens.

Vermont's prior Water Quality Standards presented the most stringent *E. coli* criteria in the United States. Although this sounds protective and good, these criteria were promulgated based on overly conservative criteria. This created a situation where people refrained from swimming in waters that were in-fact suitable, resulting in an inappropriate loss of use, and in some instances, loss of economic activity. The adoption of the modern *E. coli* criteria to protect swimming uses corrects an old error, creates consistency with EPA's bacteria water quality criteria recommendations.



Swimming in the Mad River, Warren, VT.

***What do the changes to “Appendix C” mean for my property, business, or town?***

The criteria in “Appendix C” are designed to protect human and ecological health by limiting exposure to toxic chemicals. Many of the chemicals, such as copper, lead, chromium, mercury, are known to cause water pollution, but come from identified legacy sources, or atmospheric deposition. The incidence of contamination by such chemicals is rare, and usually associated with hazardous release, or known hazardous waste sites. This incidence of pollution associated with these contaminants in Vermont waters is thankfully rare, and is addressed by the Department on a case-by-case basis, most commonly by managing the responsible hazardous waste sites.



A residential fuel-oli spill from Tropical Storm Irene's floodwaters.

## ***What does the new chloride criteria mean for my property, business, or town?***

The chloride criteria are new for Vermont. Chloride in surface waters occurs naturally, as a result of wastewater discharge, or due to dissolution of de-icing salts into surface waters. In New Hampshire, the Department of Environmental Service (NHDES) has identified that deicing accounts for roughly 95% of chloride sources.

When deicing salts such as sodium-chloride or calcium-chloride dissolve, the resulting chlorides are carried freely through overland runoff into surface water, or by infiltration into groundwater. In the vast majority of surface waters in Vermont, chloride levels do not come close to levels that exceed the new criteria. However, some of the smallest streams in developed areas, or in close proximity to transportation

corridors may become polluted by excess chloride from de-icing salts.

The identification of those streams which are in-fact impaired by chlorides requires accurate water testing protocols which go beyond typical water tests. Where streams are in fact identified as impaired due to chlorides, best management practices can be developed to reduce de-icing salt use, reducing the in-stream contributions from applications.



**VTrans plow truck applying brine using a tow-behind applicator.**

The identification of impairment from chlorides due to de-icing salts will be carried out by developing and implementing a new assessment methodology, and simultaneously developing new management approaches. In the case of the latter, DEC will rely on significant work undertaken by NHDES. That agency has worked with various stakeholders to create a Salt Reduction Working Group that has been investigating chloride reduction strategies for some time ([New Hampshire Road Salt Reduction Initiative](#)). This Salt Reduction Working Group has conducted surveys of the course of many years and has identified several best management practices, opportunities for public outreach and regulatory options that could be beneficial. ([Potential Solutions for Reducing Road Salt Use in New Hampshire](#).; see also [New Hampshire Salt Reduction Best Management Practices](#)). The Department intends to convene a similar working group for Vermont.

Vermont has already undertaken certain efforts to manage chloride. For example, the Vermont Agency of Transportation re-evaluated its deicing practices in the mid-1990s and established new “smart salting” practices to lower salt usage ([Effects of Highway Road Salting on the Water Quality of Selected Streams in Chittenden County, Vermont, November 2005–2007](#)). The VTrans Snow and Ice Control Plan describes operational procedures and best management practices for storing and utilizing snow and ice

control materials, and for performing winter maintenance activities ([VTrans Snow and Ice Control Plan](#)).

**How do the new nutrient criteria work?**

The nutrient criteria will ensure that rivers, streams, and inland lakes do not become over-enriched by phosphorus, resulting in the types of algae blooms that can be observed in Lake Champlain and other phosphorus-polluted waters in Vermont. The nutrient criteria consist of numeric limits for phosphorus, coupled with a suite of measurements that are made to document the effects of that phosphorus in streams and inland lakes. The criteria are achieved either by attainment of the numeric phosphorus criteria values, or by attainment with all of the response indicators. The nutrient criteria are summarized by the following table.



Algae bloom in a lake, resulting from excessive phosphorus pollution

Phosphorus criteria (parts per billion – ppb)	Response Indicators	Relationship of response indicator to phosphorus
Streams – 9 ppb to 27 ppb, depending on the classification of the waterbody and the stream type	pH	High levels of nutrients cause the natural pH of water to increase due to algae blooms.
	Dissolved Oxygen	High levels of nutrients will enhance algae growth. When this dies off, oxygen in water is used up, resulting in oxygen depletion.
	Turbidity	Turbidity is a measure of sediment and other particulate matter in water. Sediments are effective at carrying phosphorus to downstream waters.
	Aquatic Biota	Macroinvertebrates (stream insects and related organisms) have been shown to be very sensitive to nutrient enrichment <sup>1</sup> and are used to document phosphorus enrichment.
Lakes – 12 ppb to 18 ppb, depending on the classification of the waterbody	pH	Same effects as above.
	Secchi disk	Increases in phosphorus in lakes decrease water transparency, which is measured using a Secchi disk.
	Chlorophyll-a	Chlorophyll-a is a direct measure of algae growth in open lake waters, and increases in phosphorus in lakes enhance the likelihood of algae blooms.

1) See [http://www.vtwaterquality.org/mapp/docs/mapp\\_nutrient\\_tsd.pdf](http://www.vtwaterquality.org/mapp/docs/mapp_nutrient_tsd.pdf)



## ***What do the new nutrient criteria mean for my property, business, or town?***

Waters that are identified as in violation of the new criteria will be scheduled for the development of pollution control plans that may take several forms, depending on the variety and severity of the phosphorus sources. Sources that may be regulated as a result of these criteria include industrial or municipal wastewater facilities, fish hatcheries which discharge high levels of phosphorus, and also diffuse, or nonpoint sources. Total maximum daily load pollution control plans may be needed in the case of inland lakes or stream segments where non-point pollution sources are diverse and extensive, or if a collection of regulated facilities is determined, in aggregate, to be jointly responsible for pollution in a downstream receiving water. If only one or two sources are evident, the Department may elect to pursue other means to address the pollution, which may be addressed based on existing legal jurisdictions. Certain new water quality monitoring requirements will also be requested of facility operators, to allow the State to assess compliance with the new criteria. Over successive permit renewal cycles for each facility, such monitoring information will be examined to determine the need for additional treatment, possibly including phosphorus removal technology.



*Algae growing on a stream bottom.*

## ***What Public Process was used to develop these revisions?***

A comprehensive public process was carried out to propose, evaluate, and finalize the amendments. This process commenced with the convening of a Water Quality Advisory Committee consisting of state and academic experts, advocates, and the regulated community. This committee met several times to identify suitable updates to the rule, evaluate their technical validity, and to identify stakeholders. Following the work of the Committee, the Division carried out a pre-rulemaking stakeholder process, during which public meetings were offered to stakeholders to offer comment on the proposed rules. As a result of these general meetings, Stakeholder-specific meetings were also convened to further explain the applicability of the new phosphorus criteria and the new criteria for de-icing salt residues (chlorides). After these meetings were complete, the Division engaged in the public rulemaking process, during which time three public hearings were held, comments received, and a responsiveness summary prepared.

**Next Steps:**

Following final EPA approval of the Standards, the Division will be implementing the newly revised Standards. One specific next step will be to convene a stakeholder group to evaluate draft guidance for assessing chlorides in surface waters, and to develop best management practice approaches to managing chlorides. In addition, the Division will also re-convene the Water Quality Advisory Committee, to discuss additional approaches to modernize Vermont's Water Quality Standards. Opportunities to further enhance the protectiveness of the Standards will be considered with this group during 2015.

