

Proposed 2017 Vermont Stormwater Management Manual Rule

Summary of Proposed Changes

September 21, 2016

The Department's Stormwater Program recently released the Proposed 2017 Vermont Stormwater Management Manual (VSMM) Rule (the "Manual") approved by the Interagency Committee on Administrative Rules on September 12, 2016 and filed with the Secretary of State on September 16, 2016, to commence the state rulemaking process. The proposed Manual, distributed to stakeholders on August 31, 2016, establishes the post-construction stormwater treatment standards for projects subject to stormwater discharge permitting in Vermont, and is proposed pursuant to 10 V.S.A. §1264.

In support of the Department's recent posting of the proposed rule, the Stormwater Program has developed this summary of proposed changes for the design community and other stakeholders that identifies major changes between the March 1, 2016 draft of the VSMM and the Proposed 2017 VSMM Rule. The major changes include to format and content. This summary of proposed changes should assist designers and other stakeholders in their review of the changes in advance of the public comment period and scheduled public meeting on the proposed Manual. This summary is not inclusive of all changes to the Draft but highlights substantial changes in format and requirements.

Initially you may notice that the proposed 2017 VSMM Rule is shorter in length than the March 1, 2016 draft. For purposes of rulemaking, the Department chose to focus on the required elements of the VSMM that set design requirements and standards. Therefore, the Manual content is reflective of only the requirements, including the Site Design and Stormwater Treatment Practice Sizing Criteria (Subchapter 2.0) and the establishment of Acceptable Stormwater Treatment Practices (Subchapter 4.0), and the applicable design requirements. The Manual content proposed for rulemaking also includes Subchapters 1.0, 3.0, 5.0, 6.0, and 7.0 (Definitions). This differs from the Draft in that all content previously identified as Design Guidance, including graphical depictions, and STP example design schematics, have been excluded for purposes of rulemaking. The Site Planning and Design section of the Draft also contained predominantly all design guidance, and has since been revised to include only required elements pertaining to stormwater design under the Manual as further detailed below in this summary.

Following adoption of the 2017 VSMM, the Department expects to package the content of the adopted final rule in a manual format, with retained guidance, including updated design schematics and photos. This approach will allow the Department to revise and update guidance, schematics, and photos outside of the rulemaking process, in response to designer and stakeholder feedback when necessary.

Manual Framework

Runoff Reduction and STP Selection

The overall framework of the Manual is again reflective of a *runoff reduction* approach presented in the Draft and will require that stormwater designers first consider the acceptable stormwater treatment practices (STPs) that are expected to achieve the highest total phosphorus (TP) removal, which are those practices that are able to infiltrate to meet the Water Quality Treatment Standard as detailed further in this summary below. This was previously noted in the Draft as a consideration up through the Channel Protection Standard and has since been revised in the Manual for design consideration for the Water Quality Treatment Standard.

Anti-degradation (Section 1.2)

The Manual now includes specific section pertaining to conformance with the Anti-Degradation Policy of the Vermont Water Quality Standards which was absent from the Draft.

Protection of Groundwater (Section 1.3)

The Manual now includes specific section pertaining to the protection of groundwater quality which was absent from the Draft. The Draft previously included horizontal setbacks for structural infiltration systems from groundwater sources and infiltration prohibitions related to stormwater hotspots, which remain in the Manual with revisions as detailed below in this summary.

Effective Date and Transition (Section 1.4)

The Manual now includes specific language pertaining to the target effective date, and further provides language pertaining to Transition for public transportation projects.

Site Planning and Design (Section 2.1)

As noted above, the section as included in Draft was predominantly guidance, as such most content was removed from the Manual proposed for rulemaking. Site Planning and Design has been further revised in the Manual to include additional design strategies for meeting the applicable treatment standards, including *Site Balancing* and *Net Reduction*, two additional methods incorporated into the Manual in response to designer and stakeholder feedback. This section further references Subchapter 6.0, a new section of the Manual that provides additional design strategies specific to public transportation projects, as further detailed below in this summary.

Construction Sequencing and Inspection/Maintenance

The Draft had included both Construction Sequencing and Inspection/Maintenance, specific to the Acceptable Stormwater Treatment Practices. The provisions had included both Required Elements and Design Guidance. The Manual now excludes nearly all Construction Sequencing and Inspection/Maintenance elements, with minor exceptions. While the Department recognizes that these provisions are important for ensuring the longevity and long-term performance of a STP, these elements were considered to be better addressed through application materials and permit conditions. Elements that were determined to be a design component necessary for STP function, and deemed necessary for conducting subsequent inspection and maintenance remain in the

Manual, and are included as Required Elements. An example of such a required element would be providing for an observation well in an infiltration trench or other subsurface infiltration system for inspection purposes.

Treatment Standards

Post-Construction Soil Depth and Quality Standard (Sections 2.2.1.1, 3.0)

In response to both comment and further refinement by the Department, the Post-Construction Soil Depth and Quality Standard is revised in the Manual. The standard in the Manual will now require a 4-inch restored topsoil depth versus the 8-inch depth previously specified in the Draft. The standard in the Manual was also further refined from 5% organic matter dry weight to 4%. These changes were determined necessary to be more representative of commonly developed soils in Vermont. The standard in the Manual now will allow for designers to develop plans that conform to the standard and that provide the required direction to contractors for compliance with the standard, rather than a strict reliance on the designer to conduct test holes for standard verification during or following construction.

Groundwater Recharge Standard (Section 2.2.3)

As had been included in the Draft, the Manual includes an increase in the Recharge Factor (F), for Hydrologic Soil Groups (HSG) A, B, and C soils. This increase is considered to be in-line with the shift to a runoff reduction approach to stormwater management and was determined to coincide well with the refinements made to STP design requirements that aim to allow for greater use of infiltration practices and greater use of stormwater disconnection that promotes infiltration and higher TP removal. The Groundwater Recharge Standard proposed in the Manual remains primarily unchanged in substance from the standard proposed in the Draft.

Water Quality Treatment Standard (Sections 2.4)

The Water Quality Storm event identified in the Manual, and representative of the 90th percentile, 24-hour storm event, is 1.0 inch. This value represents an increase from the 0.9-inch value previously established in the 2002 VSMM. New development is subject to treatment of 100% Water Quality Volume (WQ_v) as had also been included in the 2002 VSMM and the Draft. Redevelopment of impervious surfaces is subject to 50% WQ_v treatment (or 25% impervious surface removal) in the proposed Manual as had been proposed in the Draft. This increase for redevelopment treatment in the Manual remains unchanged from what was included in the March 1, 2016 draft. Unlike the Draft, the proposed Manual now includes an equation for calculating a combination of the two redevelopment methods for meeting the standard. The Manual also provides greater flexibility for redevelopment projects to achieve equivalent pollutant reduction through proposal of alternative stormwater treatment practices.

Water Quality – STP Selection (Sections 2.2.2, 2.2.4.1)

The Manual no longer specifies a single value for pollutant removal, such as the 2002 VSMM that had established the performance goals for the Water Quality Treatment Standard as 40% TP and 80% Total Suspended Solids (TSS). Rather the Manual now establishes a range pertaining to TP removal to ensure that when possible, sites and projects will implement the highest performing acceptable STPs. The framework for STP selection and the requirements for use of higher performing practices has been articulated in much greater detail in the Manual, primarily through the establishment of tiered practices and more specificity with regards to

STP selection. Tier 1 practices are expected to exceed 80% TP removal, Tier 2 practices 60-80% TP removal, and Tier 3 practices 50-60% TP removal. The revised framework of the Manual also provides consideration for existing stormwater infrastructure designed to the 2002 VSMM. The Draft identified the TSS removal efficiency at 85% in consideration of higher performing practices that could achieve greater than 80% TSS, such as those that infiltrate. The proposed Manual has since shifted back to the current 80% TSS performance goal which is more representative of all acceptable water quality treatment practices in the Manual. Water quality treatment will therefore be dictated by STP Selection and site feasibility.

Time of Concentration (T_c) (Section 2.2.4.3)

As had been proposed in the Draft, the Manual specifies use of the Watershed Lag Method for calculation of the T_c which is considered to be in-line with the proposed runoff reduction framework. In response to comment, the proposed Manual has been revised to allow for the use of other T_c calculation methods when approved by the Department, which will allow designers to utilize in certain cases, existing complex models previously developed under the 2002 VSMM framework, with modifications as necessary.

Channel Protection Standard (Section 2.2.5)

The Channel Protection Standard in the revised Manual more explicitly describes the three methods for meeting the standard, including the new Hydrological Condition Method, the Extended Detention Method, and the Alternative Extended Detention Method. As had been proposed in the Draft, the waiver from the standard for expansions of less than 1 acre was removed from the Manual.

Overbank Flood Protection Standard (Q_{P10}) and Extreme Flood Protection Standard (Q_{P100}) (Sections 2.2.6, 2.2.7)

The revised Manual now specifies that “at a minimum” off-site areas shall be modeled as existing condition, to allow for designers to model off-site areas at ultimate build-out conditions when appropriate. These two standards now also limit characterization of pre-development land use and condition to “woods in good condition,” with the exception of existing impervious surfaces, which may be characterized as it exists.

Stormwater Hotspots (Section 2.3)

The section pertaining to Stormwater Hotspots was revised in the Draft and consolidated in the proposed Manual, so as not to specify a list of “stormwater hotspots.” The Manual however remains explicit in regards to the types of sites and activities that may be considered stormwater hotspots. Under the proposed Manual, infiltration through structural and non-structural STPs for contributing drainage from stormwater hotspot land uses or activities is prohibited.

Acceptable Stormwater Treatment Practices

Pre-Treatment Swale (Section 4.1.1)

Pre-treatment swale design requirements were revised from the Draft. In the proposed Manual, check dams or similar grade controls will only be required when slopes exceed 5%. In addition, pre-treatment swales will require 5-minute minimum residence time based on the peak flow rate from the water quality storm, as opposed to 10-minutes that had been specified in the Draft. The geometry requirement for pre-treatment swales was also relaxed in the proposed Manual to allow for maximum side slopes of 2:1 (H:V).

Pre-Treatment Filter Strip (Section 4.1.2)

In the proposed Manual, the Pre-Treatment Filter Strip no longer requires a “pavement drop” as part of the design requirements as had been initially presented in the Draft.

Reforestation and Tree Planting (Section 4.2.1)

The Reforestation section of the Draft was substantially simplified in the proposed Manual. This section also now relaxes the allowable minimum reforestation area and includes the ability to credit not only reforested areas, but individual tree planting under the Hydrologic Condition Method of the Channel Protection Standard. This will allow this non-structural practice more latitude in urban or otherwise more developed areas.

Watershed Hydrology Protection (Section 4.2.4)

The STP is no longer restricted to high elevation renewable energy or telecommunications projects, when a project includes similar site and project characteristics that allow for the ability to meet the suite of applicable design requirements.

Structural STP – Minimum Contributing Drainage Area Requirements (Subchapter 4.0)

The restrictions pertaining to minimum contributing drainage areas for structural STP which had been included in the March 1, 2016 draft have been removed, including those specified for bioretention, dry swales, infiltration basins and trenches, filters, treatment wetlands, and wet ponds. However, Seasonal High Groundwater Table (SHGWT) separation requirements for infiltration are still dependent on type and size of contributing impervious area and design storm, also specific to relaxed separation requirements for limited size residential rooftops.

Bioretention (Section 4.3.1)

Bioretention, was previously titled, “Bioretention and Rain Gardens.” In the proposed Manual, this section no longer includes the term “rain gardens” in the title, as there was not an identifiable difference between the design requirements for a bioretention STP versus a rain garden STP. Smaller bioretention systems that are often designed to capture small drainage areas for infiltration are often characterized as rain gardens and still may be designed per the Manual as proposed. Bioretention systems designed to filter then infiltrate only the water quality and recharge volumes are not subject to SHGWT separation requirements, provided SHGWT is below the designed filter bed.

Wet Swales (Section 4.3.2)

Wet swales were previously included in the Draft (Section 4.3.2) and had been identified as having limited applicability to meet applicable treatment standards. In the proposed Manual, this STP has been removed in its entirety. Swales, other than dry swales, that may be proposed by a designer for conveyance or to meet applicable stormwater detention standards are addressed in a new section in the Manual, Conveyance Swales, Section 5.3.

Infiltration Trenches and Basins (Section 4.3.3)

The proposed Manual no longer requires infiltration practices to be sited on natural slopes of <15%. Infiltration basin sizing also now allows for consideration of infiltration through side slopes in the Manual. The setback distances for structural infiltration practices established in the Draft for groundwater source protection were revised in consideration of Zones 1 and 2 of a groundwater source protection area and in relation to potable groundwater sources. Soil testing requirements for infiltration practices have now been incorporated into the proposed Manual, which were previously not included in the Draft. Pre-treatment requirements were modified to require 50% WQ_v when the infiltration rate is > 2 inches per hour, and applicable when pre-treatment is provided with a volumetrically sized pre-treatment practice such as a forebay.

Treatment Wetlands (Section 4.3.5)

The Manual has reduced safety bench width requirement from 15 feet to 10 feet when applicable for constructed shallow surface treatment wetlands. As noted above, contributed drainage area restrictions that were included in the Draft have since been removed from the Manual.

Wet Ponds (Section 4.3.6)

The Manual has reduced safety bench width requirement from 15 feet to 10 feet when applicable for wet ponds. As noted above, contributed drainage area restrictions that were included in the Draft have since been removed from the Manual.

Detention and Conveyance Practices (Subchapter 5.0)

In the Draft, this section had been titled “Stormwater Treatment Practices with Limited Applicability.” This section, now Subchapter 5.0 in the Manual is renamed and representative of both detention practices and conveyance swales, that are applicable in stormwater design when combined with water quality treatment and groundwater recharge practices, for meeting the detention standards such as the Channel Protection Standard, Overbank Flood Protection Standard, and Extreme Flood Protection Standard. Pocket Ponds, a design variant of a Wet Pond in the 2002 VSMM, and as previously included in the “limited applicability” section of the Draft, was removed from the proposed Manual.

Public Transportation Projects (Subchapter 6.0)

Subchapter 6.0 which pertains specifically to public transportation projects is a new section added to the proposed Manual to address the variety of physical constraints associated with projects located within existing public rights-of-way. This section was developed in response to comment and through a subsequent collaborative effort between the Department and the Vermont Agency of Transportation. Some of the design strategies that are relied upon within Subchapter 6.0 such as *Site Balancing* are available for other types of projects, as highlighted in Section 2.1, Site Planning and Design.

Definitions (Subchapter 7.0)

In the Draft, this section had been titled “Glossary.” This section, now Subchapter 7.0 in the Manual is renamed, “Definitions.” This section was revised and refined to remove unnecessary definitions, clarify, and add definitions as necessary based on the proposed Manual.