

By Jennifer Brophy-Price

STORMWATER Regulation Effects On the Building Industry

On December 9, 2009, the Virginia Soil and Water Conservation Board (SWCB) unanimously adopted new statewide stormwater management (SWM) regulations that will reduce the allowable pollutant load a development project can discharge during storm events. Now just two months later, in February 2010, suspension of the new regulations appears imminent as HB 1220 and SB 395 have passed the Virginia House and Senate, respectively. HB 1220 states that the new regulations “shall become effective within 280 days after the establishment by the United States Environmental Protection Agency of a Chesapeake Bay-wide Total Maximum Daily Load (TMDL) but in any case no later than December 1, 2011.” By suspending the regulations, the SWCB will be able to base the new target loadings on data published and enforced by the US Environmental Protection Agency (EPA), rather than try to hit a moving target.

For instance, between the October 5, 2009, draft regulations and the December 9, 2009, approved regulations, the SWCB revised the Total Phosphorus (TP) target loading rate from 0.28 lb/ac/yr to 0.45 lb/ac/yr because the EPA released revised draft basin-wide target loads for nitrogen and phosphorus based on Phase 5.2 of the Chesapeake Bay Community Watershed Model. This more recent phase of the Bay Model showed higher allowable loads than previous projections. The next version of the model (Phase 5.3) is expected to be released this spring, which may again result in changes to the loading rate.

Comparing the Existing and Proposed Regulations

On the surface, this currently-proposed allowable loading rate appears to be the same as what Tidewater localities currently regulate

under the Chesapeake Bay Preservation Act. However, it is actually more restrictive in most situations. If the new regulations come into effect in 2011 as currently written, developers will need to assess each site’s post-construction runoff volume and TP load using the Virginia Runoff Reduction Methodology (VRRM). One difference between the VRRM and current calculation methods is that current methods only account for runoff from impervious surfaces, while the VRRM accounts for runoff from all non-forested land uses on a site. The TP loading rate applied to lawns and manicured areas is significant¹ and this change in methodology results in TP loads that are up to five times higher for low-density sites on clayey soils and up to 10 percent higher for high-density sites (with 65 percent imperviousness and above). Both methods converge on the same TP load (2.17 lb/ac/yr) at 100 percent imperviousness.

In Fairfax and Prince William Counties, which have historically managed TP by reducing the post-development load on a percentage basis (40 percent reduction in Fairfax County outside the Occoquan watershed and 50 percent elsewhere in Fairfax and Prince William Counties), the new regulations will require greater SWM control at higher development densities, but less control at lower densities. Projects in Prince William County and the Occoquan watershed in Fairfax County with a post-development imperviousness greater than approximately 20-30 percent (depending on soil type) will need to reduce TP by up to 80 percent under the proposed regulations, versus 50 percent under the current regulations. Similarly, projects outside the Occoquan watershed in Fairfax County with a post-development imperviousness greater than approximately 15-25 percent will also now be required to reduce TP by up to 80 percent under the proposed regulations, versus 40 percent under the current regulations. But the good news is that

projects with lower densities will require less stringent TP reductions than before. This assumes, however, that Fairfax and Prince William counties will follow the new DCR regulatory requirements. It is probable that the 50 percent post-development pollutant load reduction requirement in the Water Supply Protection Overlay District (WSPOD) portion of Fairfax County (i.e., the Occoquan Watershed) would become a minimum requirement due to the WSPOD's litigation history and existing regulatory requirements.

Using the New Assessment Tool

The VRRM assessment tool is a series of Excel spreadsheets that calculates a site's runoff volume, Total Nitrogen (TN), and TP loads based on a 1" rain event; it also calculates the volume, TN, and TP load reductions achieved through the application of SWM best-management practices (BMPs). The VRRM assessment tool models conventional BMPs, such as wet ponds and extended detention ponds, as well as newer BMPs such as green roofs, rainwater harvesting, permeable pavement, and bioretention. BMPs can be assessed as individual treatment options, or they can be chained together in a treatment train for higher reductions. For instance, runoff from a green roof can be routed through a bioretention system before entering a wet pond; each practice will count toward volume and nutrient removal.

The VRRM assessment tool is coupled with new BMP efficiencies and design guidelines. In some cases, these new guidelines are good news for designers and help to ease the burden of more stringent TP load restrictions. For instance, current wet pond guidelines provide 40 percent to 65 percent TP removal, whereas proposed wet pond guidelines allow for 50 percent to 75 percent TP removal depending on the specific design. In other cases, however, the proposed removal efficiencies are lower than current efficiencies. For example, current bioretention basin guidelines allow

50 percent to 60 percent TP removal, while proposed guidelines only allow 25 percent to 50 percent.

More About the TMDL and other Federal Regulations

The Chesapeake Bay TMDL, which will define the maximum allowable pollutant load the Bay can accept while still maintaining a healthy ecosystem, is due for approval in December 2010 after the

completion of the Phase 5.3 Model this spring and a public comment period during the summer. Through the TMDL, EPA will direct the states to reduce Total Nitrogen (TN), Total Phosphorus (TP), and sediment loads from all pollutant sectors (including wastewater, urban/suburban runoff, and agriculture, among others). The allowable pollutant loads allocated to each sector will be determined by the states' Watershed Implementation Plans. The TMDL will also include the requirement for the states

Quality Construction...

above expectations.

HITT

BEST & GREAT PLACES TO WORK
WASHINGTON BUSINESS JOURNAL
WASHINGTONIAN

HITT CONTRACTING INC.
Powered by the People

703.846.9000
www.hitt-gc.com

to publish and work toward two-year milestones; these milestones will help hold the states accountable for having pollution control measures in place by 2025. The EPA anticipates that the Bay will not be “clean” for many years after the control measures are in place.

Finally, Congress is currently considering the Chesapeake Clean Water and

Ecosystem Restoration Act of 2009 (H.R. 3852 from Rep. Cummings [D-MD] and S. 1816 from Senator Cardin [D-MD]), which would require, as one of its goals, that the owner or operator of any development or redevelopment (with an impervious footprint exceeding a yet-undefined threshold) maintain or restore the predevelopment hydrology of the property to the “maximum extent

technically feasible.” Further, it would require compensation for unavoidable impacts to the predevelopment hydrology of the property. Similar legislation (H.R. 3265 from Rep. Connolly [D-VA]) would require that projects greater than one acre in size, that were covered with less than 5percent impervious area prior to the project, infiltrate, evapotranspire, or harvest and reuse the 95th percentile precipitation event (the 95th percentile event is defined as the event whose precipitation total is greater than or equal to 95 percent of all 24-hour storm events on an annual basis).

How these regulations are going to play out over time, and how they will affect the development community, has yet to be determined. However, it seems clear that further restrictions regarding stormwater management will be enacted, either at the state or federal levels, or both.

So what does all this mean for contractors? It will likely mean that they will be building more Low Impact Development (LID) practices, such as pervious pavement, rain-gardens, bio-swales, green roofs, etc., as opposed to more traditional SWM facilities they are more accustomed to building. Also, because many LID practices rely on infiltration, they will have to be constructed at the end of the project (after the site has been stabilized) to prevent clogging of the devices with sediment.

1 0.34 lb/ac/yr for A soils, 0.46 lb/ac/yr for B soils, 0.50 lb/ac/yr for C soils, and 0.57 lb/ac/yr for D soils

Jennifer Brophy-Price, P.E., LEED® AP, heads the sustainability department at Wetland Solutions, Inc. (WSSI), Northern Virginia's top natural and cultural resources consulting firm. WSSI's sustainability group focuses on creating state-of-the-art solutions to today's stormwater management issues.

Specialists in BIM for Construction



AutoCAD®, Revit® & Navisworks® <<
BIM Assessment & Planning <<
BIM Training & Support <<
BIM Implementation <<
SWaM Certified <<

Inlet
Technology

757.496.2323
www.InletTechnology.com

Autodesk
Authorized Training Center
Authorized Government Partner
Authorized Value Added Reseller