Economic Impact Analysis
Virginia Department of Planning and Budget

4 VAC 50-60 – Virginia Stormwater Management Program (VSMP) Permit Regulations
Department of Conservation and Recreation
May 12, 2009

Summary of the Proposed Amendments to Regulation

The Virginia Stormwater Management Program was created by Chapter 372 of the 2004 Virginia Acts of Assembly (HB1177). This action transferred the responsibility for the permitting programs for Municipal Separate Storm Sewers (MS4s) and construction activities from the State Water Control Board and the Department of Environmental Quality to the Virginia Soil and Water Conservation Board and the Department of Conservation and Recreation. This federally-authorized program is administered in accordance with requirements set forth in the federal Clean Water Act (33 USC § 1251 et seq.) as well as the Virginia Stormwater Management Act (§10.1-603.1 et seq.).

The Virginia Soil and Water Conservation Board (Board), with the assistance of the Virginia Department of Conservation and Recreation (DCR), proposes a comprehensive revision of Virginia's regulations regarding the control and treatment of stormwater runoff from land development activities. The Board proposes to amend the technical criteria applicable to stormwater discharges from construction activities, establishes minimum criteria for locality-administered stormwater management programs (qualifying local programs) and Department of Conservation and Recreation (Department) administered local stormwater management programs, as well as authorization procedures and review procedures for qualifying local programs, and amends the definitions section applicable to all of the Virginia Stormwater Management Program (VSMP) regulations.

With regard to technical criteria applicable to stormwater discharges from construction activities, revised water quality and water quantity requirements are proposed to be included in

Part II of the regulations. Water quality requirements include a 0.28 lbs/acre/year phosphorus standard for new development, a requirement that total phosphorus loads be reduced to an amount at least 20% below the pre-development phosphorus load on prior developed lands, and a requirement that control measures be installed on a site to meet any applicable wasteload allocation. Water quantity requirements include both channel protection and flood protection criteria. This action would also establish the minimum criteria and ordinance requirements (where applicable) for a Virginia Soil and Water Conservation Board (Board) authorized qualifying local program (Part IIIA) or for a Board-authorized Department-administered local stormwater management program (Part IIIB) which include, but are not limited to, administration, plan review, issuance of coverage under the General Virginia Stormwater Management Program (VSMP) Permit for Discharges of Stormwater from Construction Activities, inspection, enforcement, reporting, and recordkeeping. Part IIID establishes the procedures the Board will utilize in authorizing a locality to administer a qualifying local program. Part IIIC establishes the criteria the Department will utilize in reviewing a locality's administration of a qualifying local program.

Finally, this proposed action would make changes to definitions in Part I, which is applicable to the full body of the VSMP regulations. Unnecessary definitions are proposed to be deleted, needed definitions are proposed to be added, and many existing definitions are proposed to be updated.

Note: most of the following analysis was directly taken from a report produced by Professor Kurt Stephenson of Virginia Tech and Bobby Beamer of BBeamer LLC.[1]

Result of Analysis

The benefits exceed the costs for one or more proposed changes. The costs likely exceed the benefits for one or more other proposed changes.

[1] Stephenson, K. and B. Beamer. December 31, 2008. "Economic Impact Analysis of Revisions to the Virginia Stormwater Regulation."

Estimated Economic Impact

Summary of proposed amended regulations

The Board proposes modifications to the existing stormwater water quantity and quality requirements that will be applied to every land disturbing activity not exempted by state law (§10.1-603.8B).[2] Land disturbing activity subject to this regulation generally includes disturbances of 2,500 square feet or more in the Chesapeake Bay Preservation Act areas and disturbances of an acre or more elsewhere in the state (with some smaller areas included when a part of a larger common plan of development or sale).

The proposed regulations establish statewide water quality design criteria for land disturbing activities. For new land development projects, water quality plans must be designed so that the total phosphorus load shall not exceed 0.28 pounds per acre per year (4VAC50-60-63). The phosphorus load criterion was derived from Chesapeake Bay Tributary Strategies and reductions needed to achieve Bay-wide nutrient reductions derived from the Chesapeake Bay 2000 Agreement. The 0.28/lb/yr phosphorus design criteria represents the average per acre edge of field loading from agriculture, forest and mixed open land uses (estimated from Chesapeake Bay Program watershed model) if the 2005 tributary strategies input deck was fully implemented (DCR 2008). For development that occurs on prior developed land, the designs must allow for the total phosphorus loads to be reduced by 20% below predevelopment levels. While the Chesapeake Bay Tributary Strategies called for phosphorus reductions exceeding 40%, a lower water quality criteria for redevelopment was chosen 1) to achieve additional load reductions from urban areas over existing regulations, and 2) to avoid higher barriers to redevelopment. No explicit sediment or nitrogen water quality design criteria were established because it was determined that the stormwater management practices used to achieve the necessary phosphorus reductions would also result in reductions of nitrogen, sediment, and other potential pollutants.

Compliance is determined by implementing control practices outlined in 4VAC50-60-65. The revisions provide three general ways to reduce phosphorus loads: 1) managing land use conversion (forest, turf, and impervious cover), 2) reducing runoff volumes, and 3) treatment of

[2] Exemptions under this regulation include land disturbing activities generally associated with agricultural, forest, and mining activities (§10.1-603.8B). Road projects may also be exempted if certain minimal impacts can be demonstrated.

stormwater runoff. An initial list of best management practices that can be used to achieve the phosphorus criteria are listed in 4VAC50-60- 65B. Other BMPs available to comply with the stormwater requirements are listed on the new Virginia Stormwater BMP Clearinghouse website (http://www.vwrrc.vt.edu/swc). The removal efficiency of each BMP includes phosphorus removal from treating the pollutant concentration in the stormwater as well as the percent removal achieved by preventing runoff from occurring (based upon 1 inch of rainfall, 90% storm). The addition of the runoff reduction potential of individual stormwater control practices reflects a substantive change over the existing regulation. Similar to existing practice, the calculation of phosphorus loads is based primarily on the "simple method" (see Virginia Stormwater Handbook) that relates phosphorus load to total impervious surface. The simple method calculation, however, is modified by adding phosphorus loading coefficients for turf and forest land cover. To assist in determining compliance, DCR has also developed an Excel stormwater compliance spreadsheet.

Water quantity control requirements (4VAC50-60-66) establish minimum standards for downstream flood protection and stream channel protection. The proposed regulation establishes different criteria based on the condition of the existing stormwater conveyance systems. Four general classifications of conveyance systems are identified: 1) man-made conveyance systems, 2) restored streams (designed to restore natural steam channels), 3) stable natural stream channels, and 4) unstable natural stream channels. For stream channel protection, general water quantity criteria are (4VAC50-60-66A):

- Man-made conveyance: stormwater releases following land disturbing activity conveys post-development peak flow from 2-year, 24-hour storm without causing erosion.
- Restored stream channel: runoff following land disturbing activity will not exceed design of the restored stormwater conveyance system or result in instability of that system.
- Stable natural stream channel: will not become unstable as a result of the peak flow from the 1-year, 24-hour storm and provides a developed peak flow rate equal to the pre-developed flow rate times the pre-developed runoff volume divided by the developed runoff volume.

- Unstable natural steam channel: runoff following a land-disturbing activity shall be released into a channel at or below a peak developed flow rate based on the 1-year 24-hour storm where the developed peak flow rate is equal to the peak flow rate from the site in a forested condition times the volume of runoff from the site in a forested condition divided by the developed runoff volume.

For flood protection, general water quantity criteria are (4VAC50-60-66B):

- Man-made conveyance must confine the post development peak flow rate from the 10-year, 24-hour storm.
- Restored stream channel: Peak flow rate from the 10-year, 24-hour storm following the land disturbance will be confined within the system.
- Natural stream channel that does not currently flood during a 10-year, 24-hour storm: Post development peak flow from the 10-year, 24-hour storm is confined within the system.
- Natural steam channel where localized flooding exists during a 10-year, 24-hour storm: Post development peak flow rate for 10-year, 24-hour storm shall not exceed predevelopment peak flow from the area under forested conditions.

These criteria do not have to be met under certain conditions where the land disturbance is small relative to the size of the drainage area or results in small contributions to overall peak flow (4VAC50-60-66C). It is also possible that runoff volume reduction achieved through the implementation of water quality control practices would be sufficient to reduce or avoid the need for water quantity controls.

The proposed regulation allows, in certain situations, water quality and quantity objectives to be met offsite from the disturbed site. Section 4VAC50-60-65F and G allow land disturbers to meet water quality criteria off-site. Specifically, the proposed regulations provide that off-site controls “shall achieve the required pollutant reductions either completely off-site in accordance with the plan or in a combination of on-site and off-site controls.” In localities with an approved comprehensive watershed management plan (4VAC50-60-96), offset activities can

occur within the same Hydrologic Unit Code (HUC)[3] or any locally designated watershed. Without such a plan, offsite controls may be allowed, but must be located within the same HUC or adjacent downstream HUC to the land disturbing site (4VAC50-60-65.G.4). In addition, water quantity objectives could also be met offsite if a locality has a Board approved watershed stormwater management plan and equivalent off-site reductions are demonstrated. In areas with approved watershed plans, localities are also permitted to develop a pro rata fee program. Such a program allows land disturbers to pay a per unit fee ($ per pound of P) to meet all or a portion of a regulatory requirement. Fee funds must be used, by Virginia Code requirements (§15.2-2243), to fund actions to achieve equivalent results offsite. Local programs administered by DCR would not have fee system and must confine water quality offset activities within, or adjacent to, the impacted HUC. Additionally, the regulations also provide for a request for an exception that may be granted by a local program in accordance with 4VAC50-60-122.

Linear (road) projects are also subject to the water quality and quantity requirements (VAC 50-60-76). Unless exempt from §10.1-603.8B, linear development projects shall "control post-development stormwater runoff in accordance with a site-specific stormwater management plan or a comprehensive watershed stormwater management plan developed in accordance with these regulations"

The proposed regulations also require a stormwater management plan for land disturbing activities. The plan applies the water quality and quantity technical criteria to the land disturbance (4VAC50-60-93).

*Program Administration and Permitting**:*** The proposed regulation establishes the requirements for local governments that are required to assume the primary authority to administer the provisions of the proposed regulations as well as for those localities that may elect to administer a program (4VAC50-60-104). DCR's aim is to encourage local governments (counties, cities, and towns) that are not required to administer a program to voluntarily assume this responsibility. Local governments developing a qualifying program must administer the stormwater program in accordance with general criteria outlined in Part IIIA. In general, a local qualifying program must provide:

[3] Hydrologic Unit Code or "HUC" means a watershed unit established in the most recent version of Virginia's 6th Order National Watershed Boundary Dataset. Sixth order HUC range in size from 10,000 to 40,000 acres. See http://www.dcr.virginia.gov/soil_&_water/hu.shtml

- technical criteria to be used in the qualifying local program;
- procedures for the submission and approval of stormwater management plans (4VAC50-60-108)
- assessment and collection of fees;
- inspection and monitoring of land disturbing activities (generally 4VAC50-60-114);
- procedures and policy for long-term inspection and maintenance of stormwater facilities (4VAC 50-60-124);
- reporting and record keeping (4VAC30-60-126); and
- enforcement (4VAC30-60-116).

If the local government elects not to administer a program, DCR is required to assume the basic responsibilities of program implementation and administration described above (Part IIIB).

The regulations also define state oversight responsibilities for the Board and DCR. Section 4VAC50-60-159 describes the general procedure and requirements the Board must use for authorizing a locality to administer a stormwater management program. Once a locality is approved to administer a stormwater management program, section 4VAC50-60-157 describes Board oversight of that program. The Board must review all administered stormwater programs a minimum of once every 5 years (including those administered by DCR). The review will generally consist of reviewing approved site development plans, inspection and enforcement activities, and fee accounting practices. The Board is authorized to pursue corrective actions for noncompliant local programs.

Summary of the estimated economic impact

The proposed revisions to Virginia stormwater regulations will likely produce improvements in the condition of receiving waters. The new emphasis on reducing runoff volumes can produce important benefits related to the condition of aquatic habitat by reducing the energy pulses produced during storm events. New water quantity control requirements also provide benefits in terms of additional flood protection and in-stream aquatic protection. Acknowledging and accounting for the runoff reduction potential of many types of stormwater control practices will increase compliance options and increase the effectiveness of state stormwater regulations.

The proposed regulatory revisions also impose more stringent stormwater water quality criteria. The proposed stormwater regulatory revisions will produce additional reductions in phosphorus and other effluent loads produced from urban land conversion (land use change to impervious cover and turf). Achieving additional improvements in the quality of stormwater will impose new costs on land development activities. In development case examples, the new water quality and quantity standards could be achieved on the development site. The cost of incremental reductions in nutrient loads from the application of stormwater controls, however, is high relative to other nutrient removal options. Uncertainties exist over the long-term cost and effectiveness of many stormwater control practices. The cost of achieving additional nutrient reductions in highly urban settings and other areas with site specific constraints is still uncertain but potentially high. The off-site and pro-rata provisions in the regulation offer opportunities to lower costs and enhance benefits to affected watersheds if properly implemented. The total incremental costs to the state of implementing additional stormwater control practices to meet the proposed regulatory changes could not be estimated at this time.

The proposed revisions apply the same water quality and quantity criteria across the entire state. New proposed stormwater water quality criteria was based on estimates of the nutrient reductions needed to achieve reductions called for in the Chesapeake Bay Tributary Strategies. Economic efficiency of the proposed regulation could be improved by applying differential water quality criteria in watersheds across the state based on the relative water quality benefits that can be achieved.

The proposed regulation will produce improvements in the stormwater permitting structure and will strengthen the administrative tools localities need to implement stormwater programs. While the proposed changes will increase the number and type of control practices that can be used, these changes will also increase the sophistication and resources needed for stormwater design and program administration. The greater expected use of smaller scale distributed practices could increase the costs of local stormwater management, particularly in terms of ensuring the long-term maintenance and performance of stormwater control practices over time. The local and state government cost to administer local stormwater programs will increase (rough estimates range between $13 and $17.5 million, but estimates are not final). State agency cost (DCR) for overall program administration will be a minimum of $3 million per year (estimates are not yet final). These costs are expected to be partially to fully covered by additional fees imposed on land disturbing permit applicants.

Further detail on estimated costs and benefits can be found in the Stephenson and Beamer report, which is Appendix C in the Agency Background Document associated with this proposed action.

Businesses and Entities Affected

The general public and businesses throughout the Commonwealth benefit from additional stream channel and flood protection. Commercial and recreational fisheries benefit from improved water quality. Cleaner waters also benefit tourism–based businesses.

The proposed regulation revises water quality and quantity control requirements for land disturbing activities. As such, the proposed regulations will directly impact private land developers, public land developers, businesses, and homeowners. Virginia residents will also likely pay for the higher costs associated with local stormwater program requirements.[4]

Public agencies (such as state colleges and universities, state agencies, and municipalities) involved in public works and construction projects will also be required to comply with these requirements.

[4] For localities with stormwater utilities, the increase in cost for stormwater control facilities long-term maintenance may be paid for by higher fees. Other localities would have to cover the higher costs through existing local and state revenue sources.

The direct expenditures (costs) associated with implementing the proposed stormwater requirements may increase upon the current demand for stormwater design and construction services. The comprehensive nature of the regulations and the additional technical requirements will necessitate the greater use of environmental consultants and engineers to design stormwater plans and oversee the implementation of stormwater practices. Businesses providing construction and earthmoving services will also be impacted.

Localities Particularly Affected

All Virginia localities are significantly affected by the proposed amendments.

Projected Impact on Employment

Since the comprehensive nature of the regulations and the additional technical requirements will necessitate the greater use of environmental consultants and engineers to design stormwater plans and oversee the implementation of stormwater practices, there will likely be more demand for their services and some increase in the value of associated firms.

Effects on the Use and Value of Private Property

Since the comprehensive nature of the regulations and the additional technical requirements will necessitate the greater use of environmental consultants and engineers to design stormwater plans and oversee the implementation of stormwater practices, there will likely be more demand for their services and some increase in the value of associated firms. Cleaner water may also add to the profitability of some commercial fisheries. Also, increased demand for stormwater design and construction services may result higher value in some associated firms.

Private land developers across the state may face increased land development costs associated with these new regulations in many situations. A portion of those costs will be passed down to buyers of newly constructed properties, homeowners and businesses. Although maintenance of stormwater control facilities should be conducted under today's regulations, many commercial property owners and some residential property owners across the state may still face higher long-term costs associated with maintenance of stormwater control facilities because of the potential for the installation of a greater number of these facilities to meet the proposed requirements and higher maintenance costs associated with some types of BMPs.

Virginia residents will also likely pay for the higher costs associated with local stormwater program requirements

Small Businesses: Costs and Other Effects

Numerous small businesses, particularly those involved in aquaculture and tourism, will benefit from improved water quality. Those and other firms will benefit from reduced flooding risk. As mentioned above, stormwater design and construction services and environmental consultants and engineers will likely encounter greater demand for their services.

On the other hand, private land developers will face increased land development costs associated with these amended regulations, and a portion of those costs will be passed down to buyers of newly constructed properties including small businesses.

Small Businesses: Alternative Method that Minimizes Adverse Impact

The proposed revisions apply the same water quality and quantity criteria across the entire state. New proposed stormwater water quality criteria was based on estimates of the nutrient reductions needed to achieve reductions called for in the Chesapeake Bay Tributary Strategies. Economic efficiency of the proposed regulation could be improved by applying differential water quality criteria in watersheds across the state based on the relative water quality benefits that can be achieved. In other words, there are areas of the state where the environmental benefit of a 0.28 lbs/acre/year phosphorus standard for new development is likely significant, and other parts of the Commonwealth where a less stringent standard would not produce a significant adverse impact. The costs for meeting the standard appear to be significant everywhere. Thus, costs could likely be significantly reduced without significantly reducing total benefit by applying differential water quality criteria in watersheds across the state based on the relative water quality benefits that can be achieved.

Real Estate Development Costs

The proposed regulatory revisions impose more stringent stormwater water quality criteria. The proposed stormwater regulatory revisions will produce additional reductions in phosphorus and other effluent loads produced from urban land conversion (land use change to impervious cover and turf). Achieving additional improvements in the quality of stormwater will impose new costs on land development activities.

Legal Mandate

The Department of Planning and Budget (DPB) has analyzed the economic impact of this proposed regulation in accordance with Section 2.2-4007.04 of the Administrative Process Act and Executive Order Number 36 (06). Section 2.2-4007.04 requires that such economic impact analyses include, but need not be limited to, the projected number of businesses or other entities to whom the regulation would apply, the identity of any localities and types of businesses or other entities particularly affected, the projected number of persons and employment positions to be affected, the projected costs to affected businesses or entities to implement or comply with the regulation, and the impact on the use and value of private property. Further, if the proposed regulation has adverse effect on small businesses, Section 2.2-4007.04 requires that such economic impact analyses include (i) an identification and estimate of the number of small businesses subject to the regulation; (ii) the projected reporting, recordkeeping, and other administrative costs required for small businesses to comply with the regulation, including the type of professional skills necessary for preparing required reports and other documents; (iii) a statement of the probable effect of the regulation on affected small businesses; and (iv) a description of any less intrusive or less costly alternative methods of achieving the purpose of the regulation. The analysis presented above represents DPB's best estimate of these economic impacts.