Virginia Soil and Water Conservation Board
Stormwater Management Technical Advisory Committee
Subcommittee on Part II – Technical Criteria
Wednesday, August 16, 2006
Richmond, Virginia

Stormwater Management Technical Advisory Committee Subcommittee Members Present

Michelle Brickner, Fairfax County
Jack Frye, DCR
Shelby T. Hertzler, Rockingham County
Lee Hill, DCR
Joe Lerch, Chesapeake Bay Foundation
Ved "Wade" Malhotra, City of Newport News
R.T. "Roy" Mills, VDOT
Pat A. O'Hare, Home Builders Association of Virginia
Reginald Parrish, U.S. Environmental Protection Agency
William H. Street, James River Association
John Tippett, Friends of the Rappahannock

Facilitator

Judy Burtner, J. Burtner and Associates

DCR Staff Present

David C. Dowling, Director of Policy, Planning and Budget
Eric R. Capps, E&S Control and Construction Permitting Manager
Michael R. Fletcher, Director of Development
Kevin Landry, Stormwater Compliance Specialist
Joan Salvati, Director, Division of Chesapeake Bay Local Assistance
Christine Watlington, Policy, Planning and Budget Analyst
Ryan Brown, Office of the Attorney General

Others Present

Barbara Brumbaugh, City of Chesapeake
Laura Wheeling, Hampton Roads PDC
Charles Williamson, Prince William County

Welcome

Ms. Burtner welcomed attendees to the meeting and said that the purpose of the meeting was to address the Technical Criteria in Part II of the regulations.

She said that the subcommittee would review the draft and make recommendations prior to the draft being submitted to the full TAC for review. She explained that where consensus was reached that would be acknowledged. The viewpoints of the subcommittee will be presented to the TAC.

Ms. Burtner said that Mr. Hill would review the draft as prepared by staff.

Ms. Burtner said that an alternative proposal has been developed and that Bill Street would review that. Following Mr. Street's presentation, the committee would review the draft from DCR section by section allowing for comments from Mr. Street and Mr. Tippett and others as they apply.

Mr. Hill reviewed the draft of Part II as presented by DCR staff. A copy of this draft is included as Attachment #1.

Mr. Hill said that the minimum criteria would apply to the program whether the program was managed locally or by DCR.

Ms. Burtner said that Mr. Street and Mr. Tippett had provided an alternative proposal for consideration. She asked them to review their proposal at this time. A copy of the proposal is included as Attachment #2.

Mr. Tippett said there had been a significant degradation in tributaries. He noted that TMDLs will affect all of the stormwater programs and that it was just a matter of time before those were fully federalized.

He said that if those issues could be creatively addressed now, it would be far less onerous when the Federal government issues requirements.

Mr. Tippett said that the building and development industry has been helpful in realizing the issues and with a desire to do the right thing.

Mr. Tippett reviewed the document (Attachment #2) and made the following comments:

Volume Goal: Conventional stormwater management doesn't really address this. Under the alternative proposal, no more runoff leaves the site than if the land was in good condition. It is important to delay the water on the site.

Mr. Street said that in the water quality section of the alternative proposal the intent was to try to achieve the same loadings as under undeveloped conditions.

Mr. Street said that with regard to redevelopment a simple and understandable way to address water quality was to tie directly to the tributary strategies.

Mr. Street said there were many ways to meet the goals. The suggested Tier 1 would use onsite measures as much as possible. What cannot be achieved through those would then utilize offsite measures.

Mr. Street said that, while he recognized the need to do what can be done on site, the stream does not care if the reduction occurs on site or elsewhere. He said that he believed there were opportunities to look offsite to address and meet the remaining goals.

Mr. Street said that a fee system could be used to fund those reductions if there is no opportunity onsite or offsite to reduce runoff.

Mr. Tippett said the goal was to give various tiers and incentives. The goals are justifiable using the tributary strategies.

He reviewed the advantages as outlined in the document:

1. Helps achieve water quality standards and maintain them once they are achieved.
2. Provides flexibility to developer in meeting hydrology and water quality goals.
3. Simplifies process by focusing on volume and pollution load rather than multitude of practices.
4. Provides assurances to developer of what is required to satisfy regulators.
5. Offers possibility of developing and utilizing market mechanisms to meet stormwater goals.
6. Provides better protection to developers from NIMBY arguments about water pollution as well as citizen suits.
7. Encourages innovation and cost effectiveness in meeting stormwater goals.

Ms. Burtner thanked Mr. Street and Mr. Tippet for their presentation. She noted that members should have in front of them the following for discussion purposes:

- Working Discussion Draft for Part II of the Stormwater Regulations (Attachment #1)
- Alternative Stormwater Approach as presented by Mr. Street and Mr. Tippett (Attachment #2)
- Code of Virginia Stormwater Law (copy available from DCR)
- Engineering Calculation from the Stormwater Management Handbook (copy available from DCR)

Ms. Burtner said that with those materials in hand, the committee would review the document as presented by Mr. Hill. At the appropriate times, Mr. Street and Mr. Tippett would show where their proposal would fit in.

4VAC50-60-40 Authority and Applicability

A question was raised about the origin of the phrase, "potential harm of unmanaged stormwater."

Mr. Hill said that statement is directly from the Code of Virginia.

4VAC 50-60-50. General. - Repeal

There were no comments regarding this section.

4VAC50-60-53. General Requirements

A member suggested that the law on Subsection 7, Page 8 said the following:

> Require that stormwater management programs maintain after-development runoff rate of flow and characteristics that replicate, as nearly as practicable, the existing predevelopment runoff characteristics and site hydrology, or improve upon the contributing share of the existing predevelopment runoff characteristics and site hydrology if stream channel erosion or localized flooding is an existing predevelopment condition.

The member said that "as nearly as practicable" was missing from the General Requirements and proposed that be added at the end of the section.

A member said that the section appeared too open ended and suggested the inclusion of a reference to designate uses and water quality standards.

Mr. Hill said "as nearly as practicable" was covered further down in the document.

4VAC50-50-56. Applicability of other laws and regulations.

A members said that the original authority of the program comes from the Clean Water Act and suggested that be acknowledged in this statement. The State is actually implementing the Clean Water Act.

Mr. Hill said that not all provisions of the Clean Water Act are included in Virginia law.

4VAC50-60-60. Water quality. Repealed.

Mr. Hill noted that this section had been divided into Sections 63 and 66.

4VAC50-60-63. Water Quality

A member asked the source of the numbers.

Mr. Hill said that the numbers are from the handout from the Stormwater Management handbook.

Ms. Salvati said that 0.22 was consistent with the impervious cover level at which streams start to become impaired. Two localities use this number in their Chesapeake Bay program.

A member asked about the size of the site being developed and whether that was gross or net loading.

Mr. Hill said that this issue had to be broken down by the watershed unless it is combined into a regional stormwater management approach.

A member asked if the practices available now will allow development sites to meet these load reductions.

A member said that the nitrogen is equally if not more important than phosphorus to meeting natural resources goal, and that this has not been addressed in the stormwater program to date.

Mr. Hill said the numbers would either be 0.22 or they would revert to the proposed alternative of 0.26 or 0.28. Mr. Hill will review the numbers.

Consensus was that the subcommittee would move the 0.28 phosphorus number forward to the full TAC.

A member said that the numbers should be based on the tributary strategies. He also said there needs to be flexibility to go offsite.

At this time the committee took a break.

Ms. Burtner summarized the progress from the morning.

First, Section 63 Water Quality – with regard to the number of 0.22 and new development. The committee agrees to move this to 0.26 or 0.28.

She also mentioned the issue of nitrogen and whether that should also be reflected in the regulations.

Mr. Dowling said that DCR wants to be as aggressive as possible, but with a well-balanced approach. He said that for the full TAC meeting on Monday, August 21, Part II would be removed from the discussion and Part III would be moved forward. He said there was a solid draft for Part III to move ahead. The small group discussion on Part II can continue.

Mr. Hill noted that based on the alternative proposal, new development would have a phosphorus load of 0.26 and cannot exceed a nitrogen load of 2.68.

He noted that in Item 2 there was no difference in the proposal for non-residential. There was no breakdown for residential vs. non residential.

Mr. Street said that from the water body's perspective, it does not matter if the source of pollution is residential or commercial.

Consensus was to move items 1 and 2 together for new development with the phosphorus level at 0.26 and nitrogen at 2.68.

Mr. Frye noted that localities may choose to be more stringent.

A concern was noted that if the load is based on the tributary strategies there may be concern in the General Assembly if a local government from outside of the Chesapeake Bay Watershed approaches their representative.

Mr. Frye said that using the tributary strategies would include over half the state in the evaluation.

Ms. Salvati suggested that it would be helpful to use data from the Nationwide Urban Runoff Program in developing standards. Data has been collected from many urban areas across the country.

Item 3. Redevelopment projects.

A member questioned whether the developed state before redevelopment mattered. If a lot has 100% impervious cover and is redeveloped to have 50% impervious cover, should there be some credit as opposed to someone taking 25% and moving up to 50%.

Another member agreed and noted that going from 100% to 50% would achieve the reduction mandated by the draft.

Mr. Hill said the numbers were derived by looking at 0.45 being the default value at 16%. The use of BMPs will increase the efficiency. He noted that a reduction in the impervious area was actually a BMP.

A member said that there appeared to be an unintended consequence of the tiered approach. If a plan came in with 40% impervious cover, there is an incentive to bump that up to 50% to get a lower required loading reduction. There is an incentive to put more impervious cover on the ground.

A member cautioned against taking away incentives for redevelopment.

Mr. Hill asked if the subcommittee wanted to move ahead with what was proposed or develop a combination based on the discussion.

A member said the tiered approach works in redeveloped areas because it provides flexibility.

A member said that the regulations should try to reduce the pollutant load but also need to encourage redevelopment.

Ms. Burtner summarized and said the committee had two proposals to consider.

First, the one brought from DCR talks about percentages. The alternative proposal looks at redevelopment and phosphorus and nitrogen levels.

She asked which approach the committee would like to move forward to the TAC.

Ms. Burtner summarized that the committee liked the flat percentage concept for phosphorus and nitrogen.

Mr. Dowling said that he would like for staff to rework the document and review it with the subcommittee before presenting it to the full TAC.

Ms. Burtner asked if the committee was comfortable with DCR moving to address the four elements in the tiered approach.

A member noted that through a pro rata fee program it is very difficult to amass enough funds to move a project forward.

A member said that the hope would be that these funds encourage developers and localities to do as much on site as possible.

At this time the committee recessed for lunch.

Ms. Burtner said that the goal was to continue through the draft. She noted that there was discussion of a second meeting for this subcommittee and said there were several items to work on.

Ms. Burtner returned to the draft, Section 63, page 2, Item 4.

A member said that if you have a site that discharges into a TMDL water, the Stormwater Management Plan has to have extra considerations for the TMDL.

It was noted that the EPA must approve the TMDL as well as the impaired waters list.

Mr. Hill said that if the project does not discharge into an identified impaired water with a TMDL established by the EPA, this would not come into play.

A member asked what percentage of impaired waters did not have a TMDL.

Mr. Frye said that the language assumes impairment is something that can be partially addressed by stormwater.

A member noted that by the time the regulations were approved, most streams will have TMDLs.

Mr. Frye said there was a need to think about this in broader language. He said that within two years the nitrogen and phosphorus water quality standards should be out. He noted that there are streams now not on the list that will be listed as impaired.

A member asked the time frame for taking a stream that is impaired through the process of getting a TMDL.

Staff said the process took two years or longer.

Consensus was to move item 4 to the TAC.

Section B. The utilization of nonpoint source pollution control measures.

A member said that giving localities discretion to approve BMPs other than those specified in the Handbook could create problems.

Mr. Hill said the Virginia Water Resource Center at Virginia Tech could use the research center to set up a BMP technical committee. An efficiency would be assigned and posted on a web page.

Consensus was to move Item C forward to the TAC.

Item D.

A member suggested this section be stricken or reworded.

A member suggested this be incorporated into Item 4 and that there should be a mechanism to address known issues.

A member said the issue was broader than just impaired waters and gave karst as an example.

Consensus was for this section to be reworded and brought back for consideration.

4VAC-50-60-66 Water Quantity

A member asked if there were conflicts with the Water Quality section.

It was noted that the handbook would need to be rewritten.

Staff noted that a TAC would be established for review of the handbook.

Section A was moved forward.

Section B

It was noted that runoff characteristics need to be defined. The language was directly from the law, but a definition will be developed.

It was noted that not every site will infiltrate. Very few sites have any kind of good infiltration rates.

A member said the proposed concept was not arbitrary, but based on an LID design storm. The idea is to replicate the way the site functions when it was a forest.

Section C.

Mr. Hill noted this section was straight from the law.

Mr. Frye noted this was a special case consideration.

Section D.

DCR will add a statement referring to downstream properties or properties off site.

A member asked the definition of good engineering practices.

Mr. Hill said that would be discussed at the Part III meeting.

It was noted that the plan reviewer has the final authority. In many cases this will be a judgment call.

Mr. Hill said the regulations were attempting to address the situations and not make it worse. If these are followed and requirements met, then they are in compliance with the law.

A member proposed eliminating the sentence, "Predevelopment runoff calculations utilizing other land cover values may be utilized provided that it is demonstrated to and approved by the permit issuing authority that actual site conditions warrant such considerations."

Another member disagreed and said the sentence should stay.

There was no consensus regarding this section. DCR staff will attempt to rewrite.

Mr. Brown said that if the last line is stricken, then the regulations would be requiring an improvement in all cases.

Ms. Burtner asked if the committee was comfortable with staff reworking the section based on comments.

Mr. Dowling said staff would welcome language help on this effort.

Mr. Hill noted that staff would also take a look at the issue of volume control as well as work to develop a definition of runoff characteristics.

Section E.

There were no changes.

4VAC50-60-70 Stream channel erosion. Repeal

There were no comments.

4VAC50-60-73. Frequency

Implicit in this section is the notion that the modified rational method can be one of the methodologies utilized. This has only to do with rainfall distribution.

This is where the modified rational method was before. It was noted that there would need to be limitations regarding where this can be used.

A member suggested that under this area would be the appropriate area to mention the LID design storm.

It was suggested that "2 or 10-year" be changed to "2 and 10-year."

4VAC50-60-76. Linear development projects

There were no comments regarding this section.

4VAC50-60-80 Flooding. Repeal

There were no comments.

4VAC50-60-83 Stormwater management impoundment structures or facilities

It was noted that this section seemed to mimic the non-tidal wetland laws. The assumption is that a DEQ permit is required.

Mr. Hill said all of the necessary permits would be required.

Mr. Hill said that the section is saying that DCR and the Board will not support construction and installation of stormwater BMPs in tidal and non-tidal wetlands and perennial streams under normal circumstances.

Mr. Dowling said that the language was provided by DEQ.

Concern was expressed about another permit approving authority and coordination with the Army Corps of Engineers.

Consensus was that this section be edited to read:

> A. Construction of stormwater management impoundment structures or facilities within tidal or nontidal wetlands and perennial streams shall be avoided to the maximum extent practicable.

Section B.

No comments.

Section C.

It was noted this was to cover what is in the impounding structures.

Section D.

The following grammatical points were made:

"Shall only occur in karst areas after" should be written as "shall occur in karst areas only after."

Change "shall" to "may."

Section E.

A member asked what was meant by directly into a karst feature.

DCR staff will look at the term directly.

4VAC50-60-86. Riparian Buffers

A member asked what a buffer plan should address.

It was noted that the Division of Chesapeake Bay Local Assistance has a buffer manual that a lot of localities have been using.

The term "state waters" needs to be defined.

4VAC50-60-90 Regional (watershed-wide) stormwater management plans. Repeal

There were no comments.

4VAC50-60-93. Stormwater Management Plan Development

The term "regulated land disturbing activity" should be reviewed.

4VAC50-60-96. Comprehensive stormwater management plans.

A member asked what the term "optimal economy" meant.

Mr. Hill said if a locality develops a stormwater management plan and they have the option of six smaller basins vs. one large basin, they could use that instead.

A member asked if that argued against some of the smaller LID BMPs.

A member suggested this would be the appropriate section for the inclusion of the four tiers.

Mr. Dowling said staff would review that.

Ms. Burtner said comments should be forwarded to DCR.

Mr. Dowling reviewed the schedule for future meetings.

Full TAC, August 21
Science Museum of Virginia.

Mr. Dowling noted that proposed dates had been sent to the members for scheduling another session regarding Part II. Staff will get back to the members as soon as possible.

The meeting adjourned at 4:00 p.m.

Attachment #1

Working Discussion Draft for Part II of the Stormwater Regulation
(Tuesday, July 25, 2006 Version)

Part II Stormwater Management Program Technical Criteria

4VAC50-60-40. Authority and applicability.

~~This part specifies technical criteria for every stormwater management program and land-disturbing activity.~~

Pursuant to the Virginia Stormwater Management Law, Va. Code § 10.1-603.2 *et seq.*, the Board is required to take actions ensuring the general health, safety and welfare of the citizens of the Commonwealth as well as protecting the quality and quantity of state waters from the potential harm of unmanaged stormwater. In addition to other authority granted to the Board under the Stormwater Management Law, the Board is authorized pursuant to §§ 10.1-603.2:1 and 10.1-603.4 to adopt regulations that specify minimum technical criteria for stormwater management programs in Virginia, to establish statewide standards for stormwater management from land disturbing activities, and to ensure that there will be no unreasonable degradation of properties, water quality, stream channels, and other natural resources.

In accordance with the Board's authority, this part establishes the minimum technical criteria and stormwater management standards that shall be employed by a delegated or state-administered local stormwater management program to protect the quality and quantity of state waters from the potential harm of unmanaged stormwater runoff resulting from land disturbing activities.

4VAC50-60-50. General. Repeal

4VAC50-60-53. General Requirements

The natural, physical, chemical, biological and hydrologic characteristics and the water quality and quantity of the receiving state waters shall be maintained, protected, or improved.

4VAC50-60-56. Applicability of other laws and regulations

Land disturbing activities shall comply with all applicable laws and regulations related to stormwater management, including but not limited to the Virginia Stormwater Management Law, Virginia Erosion and Sediment Control Law and the Chesapeake Bay Preservation Act except as provided in § 10.1-603.3 subsection I and all applicable regulations adopted in accordance with those laws.

4VAC50-60-60. Water quality. Repeal

4VAC50-60-63. Water Quality

In order to protect the quality of state waters and to control nonpoint source pollution, a local program shall apply the following minimum technical criteria and statewide standards for stormwater management to land disturbing activities:

A. Pursuant to §10.1-603.4, the Board is authorized to establish minimum design criteria for measures to control nonpoint source pollution. In order to address periodic modifications due to continuing advances in types of control measures and engineering methods, such design criteria guidance is provided in the Virginia Stormwater Management Handbook. In requiring the implementation of such control measures on the development site of the land disturbing activity, a local program shall, at a minimum, incorporate the following technical criteria and stormwater management standards:

1. A local program shall require new development for residential uses to implement control measures with minimum design criteria such that the post-development pollutant load of the development site shall not exceed 0.22 pounds of phosphorus per acre per year.

2. A local program shall require new development for non-residential uses to implement control measures with minimum design criteria such that the post-development pollutant load of the development site shall not exceed 0.45 pounds of phosphorus per acre per year.

3. For redevelopment projects, a local program shall require that:

a. Projects occurring on prior developed lands that will result in impervious areas of less than or equal to 50% shall implement control measures with minimum design criteria such that the post-development pollutant load of the land disturbing site shall not exceed 0.45 pounds of phosphorus per acre per year;

b. Projects occurring on prior developed lands that will result in impervious areas of greater than 50% and less than or equal to 75% shall implement control measures with minimum design criteria such that the post-development pollutant load of the land disturbing site shall not exceed 0.60 pounds of phosphorus per acre per year; and

c. Projects occurring on prior developed lands that will result in impervious areas of greater than 75% shall implement control measures with minimum design criteria such that the post-development pollutant load of the land disturbing site shall not exceed 0.90 pounds of phosphorus per acre per year.

4. In addition to the above requirements, if a land disturbing activity discharges stormwater to a segment of a state water that has been designated as impaired by the 303(d) Impaired Waters List and a TMDL for that segment has been established and approved by the United States Environmental Protection Agency, a local program shall require that additional control measures be implemented such that post-development conditions are targeted toward the improvement of water quality for the listed impairment to the maximum extent practicable.

B. The utilization of nonpoint source pollution control measures, including best management practices (BMPs), not included in the Virginia Stormwater Management Handbook which target appropriate nonpoint source pollutants or address water quality standards or goals may be utilized in meeting the technical criteria and stormwater management standards of subsection A at the discretion of the permit issuing authority provided calculations and scientific studies verify pollutant reductions.

C. A local stormwater management program shall encourage the reduction of impervious cover and the implementation of LID in achieving the technical criteria set forth in subsection A. The reductions achieved by LID measures shall be calculated per the guidance provided in the Virginia Stormwater Management Handbook.

D. In an effort to reduce degradation or to achieve water quality standards, additional control measures may be required on a case-by-case basis to maintain and protect water quality.

4VAC 50-60-66 Water Quantity

In order to protect state waters from the potential harms of unmanaged quantities of stormwater runoff, the following technical criteria and statewide standards for stormwater management shall apply to land disturbing activities:

A. Properties and receiving state waters downstream of any land-disturbing activity shall be protected from sediment deposition, erosion and damage due to changes in runoff rate of flow and hydrologic characteristics, including but not limited to, changes in volume, velocity, frequency, duration, and peak flow rate of stormwater runoff in accordance with the minimum water quantity standards set out in this section and the guidance found in the Virginia Stormwater Management Handbook.

B. Pursuant to §10.1-603.4:7, a local program shall require that land disturbing activities:

1. Maintain post-development runoff rate of flow and runoff characteristics that replicate, as nearly as practicable, the existing predevelopment runoff characteristics and site hydrology, or

2. If stream channel erosion or localized flooding is an existing predevelopment condition, improve upon the contributing share of the existing predevelopment runoff characteristics and site hydrology per design methodology and calculations guidance found in the Virginia Stormwater Management Handbook.

C. Any land disturbing activity shall satisfy the requirements of subsection B above if the practices implemented on the site are designed to:

1. Detain the water quality volume and to release it over 48 hours;

2. Detain and release over a 24-hour period the expected rainfall resulting from the one year, 24 hour storm; and

3. Reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming that it was in good forested condition, achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition.

Such land disturbing activity shall further be exempt from any flow rate capacity and velocity requirements for natural or manmade channels as defined in any other section of this regulation.

D. For the purposes of determining compliance with subsection B, a local program shall require the following:

1. Pre-development stream characteristics shall be verified by physical surveys and calculations that are consistent with good engineering practices.

2. Flooding and channel erosion impacts to receiving streams due to land-disturbing activities shall be calculated for each point of discharge from the land disturbance and such calculations shall include any runoff from the balance of the watershed which also contributes to that point of discharge. Flooding and channel erosion impacts shall be evaluated taking the entire upstream watershed into account, including the modifications from the planned land disturbance. Good engineering practices and calculations shall be used to demonstrate post development stream characteristics, flooding and channel erosion impacts.

3. For purposes of computing predevelopment runoff, all pervious lands in the site shall be assumed prior to development to be in good condition (if the lands are pastures, lawns, or parks), with good cover (if the lands are woods), or with conservation treatment (if the lands are cultivated); regardless of conditions existing at the time of computation. Predevelopment runoff calculations utilizing other land cover values may be utilized provided that it is demonstrated to and approved by the permit issuing authority that actual site conditions warrant such considerations.

E. A local stormwater management program shall encourage the reduction of impervious cover and the implementation of LID in achieving water quantity reductions. The reductions achieved by LID measures shall be calculated per the guidance provided in the Virginia Stormwater Management Handbook.

4VAC50-60-70. Stream channel erosion. Repeal

4VAC50-60-73. Frequency

The specified design storms shall be defined as either a 2 or 10-year 24-hour storm using the rainfall distribution recommended by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS).

4VAC50-60-76. Linear development projects

Linear development projects shall control post-development stormwater runoff in accordance with a stormwater management plan or a watershed or regional stormwater management plan approved in accordance with these regulations.

4VAC50-60-80. Flooding. Repeal

4VAC50-60-83. Stormwater management impoundment structures or facilities

A. Construction of stormwater management impoundment structures or facilities within tidal or nontidal wetlands and perennial streams shall be avoided to the maximum extent practicable and should only be considered in situations where the following criteria have been met:

1. An alternative analysis has been performed and no practicable alternative exists;

2. The alternative analysis has demonstrated that the adverse environmental impacts caused by the impoundment are less damaging than the harm caused by uncontrolled stormwater or the benefits of the impoundment are in the public interest and such interests exceed the adverse environmental impacts expected from its construction and maintenance;

3. The alternative analysis has demonstrated that the permittee will take all reasonable steps to: (i) avoid adverse environmental impacts, (ii) minimize the adverse impact where avoidance is impractical and, (iii) provide mitigation of the adverse impact on an in kind basis where applicable;

4. A demonstration that the siting of the facility, its operation and maintenance will not adversely impact the instream beneficial uses or result in substantive degradation of water quality; and

5. A comprehensive operation and maintenance plan has been developed.

B. Construction of stormwater management impoundment structures or facilities within a Federal Emergency Management Agency (FEMA) designated 100-year floodplain shall be avoided to the maximum extent practicable. When this is demonstrated to be unavoidable, all stormwater management facility construction shall be in compliance with all applicable requirements under the National Flood Insurance Program, 44 CFR Part 59 and local floodplain ordinances.

C. Stormwater management impoundment structures that are not covered by the Impounding Structure Regulations (4VAC50-20) shall be engineered for structural integrity for the 100-year storm event. In no case shall the design standard be less than the 100-year storm event for any stormwater management impoundment structure.

D. Construction of stormwater management impoundment structures or facilities shall only occur in karst areas after a thorough geological study of the area has been conducted.

E. No adverse environmental impacts shall occur to any identified karst features and no permanent stormwater management impoundment structures or facilities will be constructed in karst features. Discharge of stormwater directly into a karst feature shall not occur unless otherwise allowed by law.

4VAC50-60-86. Riparian Buffers

A local program shall develop a riparian buffer plan that includes riparian protection strategies for the maintenance of existing buffers and the establishment of new buffers. To the maximum extent practicable, such a plan shall require that riparian buffers adjacent to state waters on development and redevelopment sites be maintained during and following the land disturbing activity. If no such riparian buffers are existing at the time of the land disturbing activity, then such plan shall require that riparian buffers be established.

4VAC50-60-90. Regional (watershed-wide) stormwater management plans. Repeal

4VAC50-60-93. Stormwater Management Plan Development

A. A stormwater management plan for a regulated land disturbing activity shall apply these stormwater management technical criteria to the entire land disturbing activity.

B. Individual lots or planned phases of developments shall not be considered separate land-disturbing activities, but rather the entire development shall be considered a single land disturbing activity.

C. The stormwater management plan shall consider all sources of surface runoff and all sources of subsurface and groundwater flows converted to surface runoff.

4VAC50-60-96. Comprehensive stormwater management plans

A. Localities are encouraged to develop comprehensive stormwater management plans which meet the water quality and quantity requirements of this chapter on a watershed-wide basis. State and federal agencies intending to develop large tracts of land are encouraged to develop or participate in comprehensive stormwater management plans where practicable.

B. The objective of a comprehensive stormwater management plan is to address the stormwater management concerns in a given watershed with optimal economy and efficiency and to better integrate stormwater management facilities and practices. The implementation of comprehensive stormwater management plans shall mitigate the impacts of new development, and provide for the remediation of erosion, flooding or water quality problems caused by existing development within the given watershed.

Attachment #2

Alternative Stormwater Thoughts

Guiding thoughts…

1. Focus on the quantitative and hydrologic and water quality goals, not the use of specific practices.
2. Encourage the maximum achievement of LID goals, while providing flexibility for constraints that limit the use of LID.
3. Provide flexibility in the means of achieving the hydrologic and water quality goals.
4. Structure the process to make good LID design the "path of least resistance."

Quantitative Goals

Runoff Volume Goal

Runoff shall be retained so that no more stormwater leaves the site during the design storm than would be expected if land cover were woods in good condition.

Runoff Timing Goal

Existing drainage divides shall be maintained, and the pre-development Time of Concentration shall be replicated within each catchment.

Water Quality Goal

Undeveloped Land – Nitrogen and phosphorus loads shall not exceed 0.28 lb for phosphorus and 2.68 for nitrogen (based on average per acre load for undeveloped land in tributary strategies)

Re-development – Achieve a 44% reduction in phosphorous load and 28% reduction in nitrogen load from pre-existing conditions (based on average load reductions needed from urban land uses to achieve tributary strategy allocations).

Tiered Approach to Meeting Goals

Tier 1. Distributed Onsite Controls

Integrated Management Practices (IMPs) shall be used to meet hydrologic and water quality goals to the maximum extent practicable with some minimum level of performance.

Tier 2. Traditional Onsite Controls

Traditional onsite practices shall be used to achieving remaining hydrologic and water quality goals to the maximum extent practicable.

Tier 3. Offsite Controls

After onsite practices have been utilized to the maximum extent practicable, offsite hydrologic controls, pollution reduction practices and/or purchase of nitrogen or phosphorous credits within the same watershed maybe used to meet the remaining requirements.

Tier 4. In-Lieu Fee

After all onsite and offsite opportunities have been utilized to the maximum extent practicable, the permitting authority may approve the substitution of a fee payment in lieu of remaining hydrologic and water quality goals.

Incentives for Full Onsite Replication of Pre-Development Hydrology

Local government programs are encouraged to develop and implement incentives for meeting the runoff volume and timing criteria. Such incentives could include:

1. Waiver of curb & gutter requirements for subdivisions with lot sizes greater than a specified sq. ft.
2. Waiver of dual sidewalk requirements, if alternative pedestrian mobility achieved via trails through open space.
3. Streamlined permit approval process.

Advantages to Alternative Stormwater Approach

8. Helps achieve water quality standards and maintain them once they are achieved.
9. Provides flexibility to developer in meeting hydrology and water quality goals.
10. Simplifies process by focusing on volume and pollution load rather than multitude of practices.
11. Provides assurances to developer of what is required to satisfy regulators.
12. Offers possibility of developing and utilizing market mechanisms to meet stormwater goals.
13. Provides better protection to developers from NIMBY arguments about water pollution as well as citizen suits.
14. Encourages innovation and cost effectiveness in meeting stormwater goals.