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DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

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Environmental Quality Board  
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INDEPENDENT REGULATORY  
REVIEW COMMISSION

**Subject: Public Comment - Revisions to Chapter 102 Erosion and Sediment Control and Stormwater Management**

The following comments on the Chapter 102 revisions were generated during a meeting of representatives of the private sector VUSP members. This is my interpretation of the majority of the discussion and not necessarily reflective of each VUSP member firm. Please note that the public sector members were not included in this meeting to avoid any appearance of conflict of interest. These comments are focused on what the group thought are the key issues.

**Observation**

The protection of the Commonwealth's waters requires a sustainable approach to stormwater management that directly addresses the effects of changed land use. Mitigation of urban stormwater is a complex challenge due the widely varying response of the combination of climate, land form and development across the Commonwealth. Each site has unique challenges, and requires a long term flexible approach that incorporates design, maintenance, and inspection.

To be sustainable, the stormwater program must incorporate a cyclic approach similar to that proposed by EPA in its 2005 *National Management Measures to Control Nonpoint Source Pollution from Urban Areas*, and supported by the recent National Academies report on stormwater. Much of these principles are currently applied within the current stormwater and ACT 167 programs, and within the revised CH102 regulations.

- Establish Stormwater Requirements (Ch102)
- Site Design (review / approval)
- Site Construction (inspection / approval)
- Continuing Operations (Maintenance / Inspection / Replacement)
- Evaluation of the Stormwater Requirements



From reviewing the comments of others that are publically available, there is a misperception that inflexible and restrictive guidelines will protect the Commonwealths waters. Past history has shown this is not true. This is the approach that resulted in detention and retention basins being the sole approach to stormwater over much of the last 30 years, many years past the point where it was known that this approach was

insufficient and not meeting our goals. Innovative practices such as porous pavement, disconnected flows, and seepage pits were recommended back in the early 1980's, but were generally not permitted. It should be pointed out that each detention basin built was designed, reviewed and approved based upon a narrow inflexible standard.

Clearly it is necessary to codify the PCSWM standards, and the identification of those who will operate and maintain the facilities is a good step towards a sustainable stormwater program. The following comments are intended to increase the effectiveness of the Commonwealth's stormwater program, by making it more flexible, responsive, and to avoid past errors.

### **1. PCSM – 2 Year 24 Hour Storm Volume Requirement**

It is clear that the sole reliance on the 2 year storm volume requirements (Known as CG-1 in the BMP manual) does not address all sites (Brownsfields, Karst areas, low infiltrating soils, ultra urban watersheds, etc.). This standard does not differentiate between watershed size or position (first order streams vs the Delaware River). It should be noted that the BMP manual committee recommended a second equal CG for this reason, to be used without prejudice. A lot size restriction was added in the process without consideration by the committee, which has in essence eliminated its use. From an observational view, it appears that the majority of projects are unable to meet the current CG's resulting in a negotiation for each permit, which is clearly not in the best interest of the Commonwealth, not protective, and not sustainable considering staffing and resources. It is also clear that the large volume requirements in many areas discourage the use of Green Infrastructure (Green roofs – Rain Gardens – Evaporation, Reuse) in favor of large rock bed systems, and do not balance the components of the hydrologic cycle (infiltration versus evapotranspiration). The choice of BMP needs to be balanced and include consideration of the pollutant loadings, temperature, hydrologic balance, and the inclusion of maintenance and longevity considerations. Due to these factors we recommend three concept approaches with each considered to be equal in protection.

- a) CG-1- The original CG-1 should be retained. In many areas it is applicable, appropriate, and the logical engineering choice.
- b) CG – LID Similar to that recommended in the BMP Guidance manual, intended to support a LID / Green Infrastructure approach. It would consist of three components
  - a. Volume reduction. To be set at approximately 85-90% of the yearly annual rainfall volume landing on impervious surfaces (modifications could be added for compacted urban soils). This volume would be required to be removed from all impervious surfaces for both water quality and increased runoff purposes. Note that this is similar to the 1" removal required in Philadelphia which has resulted in an explosion of green roofs. The capture of this volume will meet thermal, water quality and recharge requirements. On average in the Philadelphia region 12 events a year

would meet or exceed this value. It is not necessary to require infiltration as economically that would be the most logical option.

- b. Extended duration – The one year storm extreme event would be required to be held and detained for 24 hours past the preconstruction peak. Note that this is a extreme event criteria and would focus on the 8- 10% of flow volume not captured by the reduction. Note that the volume reduction facilities would need to be increased by over 250% to address added volume. This radical reduction of flow rates partnered with the volume reduction is intended to greatly reduce the post construction flows to levels that are not erosive. It can be met in many ways to include bio swales, stormwater wetlands, or underground detention, without compromising infiltration systems.
- c) CG – Complex – Clearly there are cases where neither CG would apply. An example would include brownfields where no infiltration is allowed, or karst areas where a majority of the runoff directly enters the groundwater. In this case, the engineer would need to prove that the design mitigated the impacts and protected the receiving waters. Examples of approaches may include stream restoration / channel stabilization, offsite mitigation / trading, large scale water reuse, treatment (sand filter), and many not yet thought of. This option would probably require a multidisciplinary team of professionals, lead by a licensed engineer, and would require a specialized review process.
- d) Flooding requirements – A more protective alternative to the peak flow based requirements are those based on continuous flow models.. For example Washington State requires that the applicant prove that their site would maintain the same annual flow duration in hours (within 10%) of extreme events starting from 50% of the two year storm to that of the 50 year storm peak. This directly relates to flooding and stream erosion for larger storms. While this would not be applicable to most smaller projects, it could be added to promote more advanced sustainable LID practices in larger projects.

It is felt that these practices would greatly increase the program flexibility of the PCSWM, and would increase the level of protection to the Commonwealths waters.

## **2. BMP Guidance Manual**

As these new requirements directly require the use of the current BMP manual, the regulations need to mandate that the manual have a continuous update process. The PCSWM requirements need to be removed from this manual (Codified or included in a second document). This would then be considered a technical engineering manual, that can be updated on a prescribed basis as mistakes are found, and research advances the knowledge base. This would be similar to PennDot technical guidance, and many other state stormwater manuals. It should be remembered that the manual was written as guidance not regulation, it is already 5 years old, contains many errors, and great strides have been made by the profession since its authoring. Note that Act 167 Plans are required to be updated within 5 years, and any plans older then that would not be

considered current by this act. As the changes to chapter 102 require the use of the manual, a high standard must be set and met, to prevent the Commonwealth from requiring substandard, harmful, or non sustainable stormwater practices. With the current economic challenges, it is questionable as to whether the resources are available to accomplish this task.

An alternative would be to allow use of knowledge that has passed the rigor of scientific review. This would include for example refereed journal articles and current manuals of practice of the American Society of Civil Engineers. It should be noted that these are the materials the BMP manual is based upon, and they require a much more rigorous review process.

### **3. Buffers**

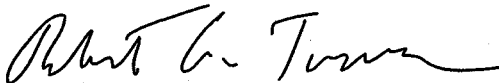
Clearly buffers are an important component to the practice of stormwater management. The group in general suggested adding a 75' buffer for perennial streams (measured from the stream edge) for all streams to compliment the EVHQ stream buffer requirements. This distance was felt to be in most cases within the CH 105 Floodway regulations.

### **4. Permit By Rule.**

Moving the focus of the regulatory environment from the design to the completed project would be considered a more protective practice. This would enhance the experience of the design professionals by involving them in the construction process, and this experience coupled with the flexibility to change designs during construction should result in a better product for both the client and the Commonwealth. I am professionally for advancing this concept. However there were several concerns from the VUSP engineering firm representatives that were raised. First, was that the responsibilities of the firm were not articulated. It was thought that the engineering firms would be shouldering a large risk. It should be clear what inspections were needed during the process, and what standards needed to be met. It was also a concern as to the process if a situation arose that the engineer could not seal the project. How would the engineer be protected from being blacklisted by potential clients? Another comment was that the requirements were so restrictive for this option that it was doubtful it would be used. The general consensus of the partners was that the PBR was not yet ready for prime time.

I appreciate the opportunity to comment on the CH102 on behalf of the VUSP Partners.

Sincerely,



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**From:** Robert Traver [robert.traver@villanova.edu]  
**Sent:** Saturday, November 28, 2009 12:31 AM  
**To:** EP, RegComments  
**Subject:** VUSP- CH102.pdf - Adobe Acrobat Professional

INDEPENDENT REGULATORY  
REVIEW COMMISSION

The attached PDF file contains my comments on the proposed Chapter 102 regulations.



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Commitment  
to Sustainability

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