Mr. Ray Bahr
Division Chief
Sediment, Stormwater and Dam Safety Program
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Sent via email to: rbahr@mde.state.md.us

Re: Comments on Proposed Maryland Department of the Environment National Pollutant Discharge Elimination System Municipal Separate Storm Sewer Discharge Permit Number: 11-DP-3314 MD0068284

Dear Mr. Bahr:

As Executive Director of the Anacostia Watershed Restoration Partnership, I have two main duties: 1. to help coordinate the restoration of the Anacostia watershed across a number of federal, state and local jurisdictions working to restore it, and 2. to advocate for its restoration. Today I submit these comments in the role of advocate. These views are my own and I am not speaking on behalf of the Partnership's members.

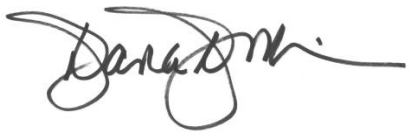
In the comments that are attached, I urge you to insure that the Municipal Separate Sanitary Storm Sewer (MS4) permit issued by the Maryland Department of the Environment (MDE) to Prince George's County reflects the current stormwater science, so that it can truly help restore the Anacostia's waters and the Chesapeake Bay. I focus these comments on the restoration requirement of the proposed permit as well as on the draft guidance that is incorporated by reference into the proposed permit. The proposed permit and the draft guidance do not require the types of restoration, e.g. green environmental site design (ESD) techniques that infiltrate, evapotranspirate, and reuse stormwater. These techniques reduce pollutants and restore hydrology better than other techniques and are supported by the current stormwater science. This aspect of the proposal needs to be improved before it is finalized in order to be consistent with the Clean Water Act's direction that water quality standards be met to the maximum extent practicable and Maryland's requirement that NPDES discharges must be conditioned on meeting

Maryland's water quality standards. The draft guidance interprets how restoration efforts will be credited against the County's waste load allocations, a key policy which should be adopted by MDE via rulemaking or in the permits and which should cover all pollutants rather than only nutrients and sediments.

Additionally, I note that Prince George's County recently agreed on permit language with several major environmental groups that that would strengthen the permit, including stating in the permit a strong preference for ESD restoration. As a former regulator myself, I would have a hard time understanding why MDE would not accept changes, requested by the permittee, which are strengthening. While other Counties may object to them, it would seem to me that what the County wants in its own permit would have great standing and weight with MDE.

Thank you very much for your service to protect and restore the waters of the State of Maryland and for your consideration of my comments.

Respectfully submitted,



Ms. Dana Minerva, JD, MSP
Executive Director
Anacostia Watershed Restoration Partnership

Attachment: Written Testimony on the Draft Prince George's County MS4 Permit

Written Testimony on the

Draft Prince George's County MS4 Permit

Ms. Dana Minerva, JD, MSP, Executive Director
Anacostia Watershed Restoration Partnership

Strong Restoration Requirements Are Necessary to Restore Maryland's Rivers and Streams

The Municipal Separate Sanitary Storm Sewer (MS4) permit for Prince George's County proposed by the Maryland Department of the Environment (MDE) contains the following provisions relating to restoration:

> Within one year of permit issuance, Prince George's County shall submit an impervious surface area assessment consistent with the methods described in the MDE document "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits" (MDE, June 2011 or subsequent versions). Upon approval by MDE, this impervious surface area assessment shall serve as the baseline for the restoration efforts required in this permit.
>
> By the end of this permit term, Prince George's County shall commence and complete the implementation of restoration efforts for twenty percent of the County's impervious surface area consistent with the methodology described in the MDE document cited in PART IV.E.2.a. that has not already been restored to the MEP. Equivalent acres restored of impervious surfaces, through new retrofits or the retrofit of pre-2002 structural BMPs, shall be based upon the treatment of the WQv criteria and associated list of practices defined in the 2000 Maryland Stormwater Design Manual. For alternate BMPs, the basis for calculation of equivalent impervious acres restored is based upon the pollutant loads from forested cover.[1]

A similar provision to this latter provision was included in the current Montgomery County MS4 permit.[2]

---

[1]Maryland Department of the Environment, *Draft National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Discharge Permit, Permit Number11-DP-3314 MD0068284* 8-9 (undated) available at http://www.mde.maryland.gov/programs/Water/StormwaterManagementProgram/SedimentandStormwaterHome/Documents/Baltimore%20City%20Permit%20with%20attachments.pdf (last visited June 26, 2013) (hereinafter "proposed permit").

[2] Maryland Department of the Environment, *National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Discharge Permit, Permit Number 06-DP-3320/MD0068349* 8-9 (February 16,2010) available at http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/Pages/Programs/WaterPrograms/sedimentandstormwater/storm_gen_permit.aspx (last visited February 27, 2013) (hereinafter "Montgomery permit").

MDE is to be congratulated for recognizing the need for and providing for restoration in its MS4 permits. Restoration is needed to restore Maryland's streams and rivers because almost all of them are in poor or fair condition, according to the state's data, and only two are in good condition.[3] According to Prince George's County's Department of Environmental Resources, only 8% of its rivers and streams meet water quality standards.[4] The State of Maryland's Baystat website explains why stormwater from impervious surfaces is a key cause of water pollution and stream degradation:

> The problem with impervious surfaces is that they prevent the natural soaking of rainwater into the ground and slowly seeping into streams. Instead, the rain water accumulates and flows rapidly into storm drains. This results in severe harm to streams in three important ways:
>
> Water Quantity: storm drains deliver large volumes of water to streams much faster than would occur naturally, resulting in flooding and bank erosion. Stream inhabitants are stressed, displaced, or killed by the fast moving water and the debris and sediment it brings with it.
>
> Water Quality: pollutants (gasoline, oil, fertilizers, etc.) accumulate on impervious surfaces and are washed into the streams.
>
> Water Temperature: during warm weather, rain that falls on impervious surfaces becomes superheated and can stress or kill stream inhabitants.[5]

Importantly, the state has concluded that it is not only the rate or speed at which impervious surfaces deliver polluted stormwater to our streams, but the large volumes that these surfaces deliver over land. In undeveloped forests and fields, stormwater seeps into the ground and recharges filtered water into streams through the ground. In developed areas, large volumes travel over land, eroding land away and picking up urban pollutants as they go.

---

[3] State of Maryland. (2013, February). Maryland's Watershed Health. *Stream Health.* Retrieved from http://www.streamhealth.maryland.gov/stream_health.asp.

[4]Coffman, L., Presentation to Transportation, Housing and Environment Committee of the Prince George's County Council on County Executive's Proposal for Implementation of HB 987, June 20, 2013.

[5]State of Maryland. (2013, February). How Impervious Surface Impacts Stream Health. *Stream Health.* Retrieved from http://www.streamhealth.maryland.gov/impervious.asp.

Maryland's conclusions about the impact of imperious surfaces and the impact of vast volumes of polluted runoff from impervious surfaces are based on well-settled science, documented by articles from peer reviewed scientific journals cited on the website of the Maryland Department of Natural Resources, which are incorporated by reference into these comments.[6] The more impervious surface in a watershed, the greater the volumes of polluted runoff, with concomitant effects: higher levels of nutrients, sediments and other pollutants, unstable and eroded stream banks and incised channels, decreased biological diversity and increased dominance of species that tolerate pollution well. There is even a term for this phenomenon that has been coined by scientists: urban stream syndrome.[7]

As noted in the comments that follow, current stormwater science (and the law) supports the use of the types of retrofits that reduce these volumes, protecting biological health (an officially designated and legally protected "use" of Maryland's streams), and measures that better reduce the mass of all types of pollutants in the discharges, rather than merely "treating" some of the pollutants in them.

The Permit and Draft Guidance Equate "Treatment" with "Restoration" and Should Be Revised

The proposed permit requires restoration but defines "restoration" as "water quality treatment" or as quoted above "treatment of the WQv (water quality volume)." The draft guidance incorporated by reference into the permit makes it absolutely clear that MDE is defining "restoration" as "treatment:"

> An acre for acre impervious credit will be given when a structural BMP is specifically designed to provide *treatment* for the full WQv (one inch), or a proportional acreage of credit will be given when less than the WQv is provided: (percent of the WQv achieved) x (drainage area impervious acres).[8] (Emphasis added)

---

[6]Maryland Department of Natural Resources, Carter Library and Information Resource Center. (2010, September). *Effects of Development and Impervious Surfaces on Watersheds*. Retrieved from http://www.dnr.state.md.us/irc/bibs/effectsdevelopment.html.

[7]Walsh, C. J., Roy, A. H., Feminella, J. W., Cottingham, P. D., Groffman, P. M., and Morgan, R. P. (2005). The urban stream syndrome: current knowledge and the search for a cure. *Journal of the North American Benthological Society* 24(3), 706–723.

[8]MDE "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits" (June 2011) at 22. (hereinafter "draft guidance." Viewed at: http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/Documents/NPDES%20Draft%20Guidance%206_14.pdf

The permit and MDE guidance include many practices that MAY improve water quality somewhat, but which are not restoration: detention, filtration, street sweeping, catch basin cleaning, nutrient management, septic system enhancement, and storm drain cleaning.

In the Montgomery permit and in the proposed permit, the restoration provisions and the provisions relating to meeting water quality standards and waste load allocations are separate and distinct requirements. (This is similar to the MS4 permit adopted by EPA for the District of Columbia wherein EPA requires specific types of ESD restoration practices *as well as* water quality treatment.[9]) However, the proposed permit has the effect of eliminating the restoration provision by defining it as water quality treatment. This approach is inconsistent with MDE's commitment that the Montgomery Permit would serve as a "floor" for all future Maryland MS4 permits. More importantly, it also does not appear to take the condition of Maryland's waters described above into account. They are desperately in need of restoration as well as pollution reduction. It is also important that as MS4s embark on the expenditure of hundreds of millions of dollars that the techniques they use are going to work the best that they can.

The State of Maryland Has Endorsed Environmental Site Design (ESD) as the "State of the Art" Approach to Stormwater Management—and ESD Constitutes True Restoration

MDE is required by law to:

> ". . . adopt rules and regulations which establish criteria and procedures for stormwater management in Maryland. The rules and regulations shall:
>
> (1) Indicate that the primary goal of the State and local programs will be to maintain after development, as nearly as possible, the predevelopment runoff characteristics;[10]

The General Assembly recognized that true restoration would require techniques that mimic natural hydrology, e. g. ESD infiltrates stormwater into the ground, evapotranspirates it into the air, or reuses it. Water quality treatment may filter stormwater, and detention may delay the delivery of stormwater volumes to rivers and streams, but both of these techniques deliver it nonetheless. They do little (other than shaving the peak flow) to restore predevelopment runoff

[9]EPA, *Permit for the District of Columbia Municipal Separate Storm Sewer System* (September 30, 2011) available at http://www.epa.gov/reg3wapd/pdf/pdf_npdes/stormwater/DCMS4/MS4FinalLimitedModDocument/FinalModifiedPermit_10-25-12.pdf (last visited February 28, 2013).

[10] Md. ENVIRONMENT Code Ann. § 4-203(b) (2013)

characteristics, especially they do nothing to reduce the volume of stormwater delivered to rivers and streams. ESD retrofits, on the other hand, reduce the volume of stormwater reaching streams and rivers, both restoring hydrology AND reducing pollutants to a greater extent than other techniques, as will be shown below.

Perhaps MDE would argue that the General Assembly intended that the reference to "after development" means "after *future* development," e.g. that the intent of the law was prospective. However, the Clean Water Act, the stated policy of the State of Maryland, and the apparent intent of the General Assembly in adopting the Stormwater Act of 2007 was to restore degraded water bodies such as the Bay and other impaired water bodies, not merely to prevent further deterioration.

Recently the Governor's office and MDE included the following statement in a press release relating to a workshop on innovative and cost-effective stormwater management techniques:

> The Stormwater Management Act, signed by Governor O'Malley in 2007 requires all new development and redevelopment projects to include state-of-the-art stormwater pollution controls. For areas that are already developed, municipal stormwater permits – sometimes known as MS4 (municipal separate storm sewer system) permits – serve as the regulatory backbone for controlling stormwater pollutants and meeting Bay restoration goals.[11]

It is clear that MDE recognizes ESD as "state-of-the-art." What is not clear is why the "regulatory backbone," MDE's MS4 permits, should also not require the state-of-the-art retrofits.

Maryland NPDES Implementing Regulations Require Pollution Reduction to Utilize the Best Available Technology and to Protect State Designated Uses--ESD Retrofits are Required

The Code of Maryland Regulation provisions condition the issuance of National Pollutant Discharge Elimination System (NPDES) permits as follows:

> A. The Department shall issue or reissue a discharge permit upon a determination that
>
> 1.The discharge or proposed discharge specified in the application is or will be *in compliance with all applicable requirements of*:

[11]Maryland Department of the Environment, "Press Release: Governor O'Malley Leads Discussion With Local Officials on Cost-Effective Approaches to Chesapeake Bay Restoration," March 4, 2013 viewed at http://www.mde.state.md.us/programs/PressRoom/Pages/2013StormwaterSymposiumPressRelease.aspx

(a) Effluent limitations,

(b) Surface and ground water quality standards,

(c) The Federal Act,

(d) State law or regulation,

(e) Best available technology, and

(f) Federal effluent guidelines;[12] (emphasis added)

The Maryland regulations cited condition the the issuance of NPDES permits on them containing requirements for the use of use of the best available technology and on protecting Maryland designated uses that are part of water quality standards. The comments below will show why ESD is the best available technology. But it should be further noted that the regulations condition discharges on meeting water quality standards including the use designations. The vast majority of Maryland's streams in urban and urbanizing areas are in failing biological health primarily due to the volumes of stormwater discharged by MS4 system sand the physical destruction of stream channels that results from those volumes. Consequently, these streams are not supporting, in whole or in part, their mostfundamental and universal use designation, which is Use I – protection of aquatic life andwildlife.[13] Permits which are not conditioned on protecting this use are not consistent with Maryland regulations.

The Permit and Guidance Endorse Extended Detention Ponds as "Restoration" Which Is Not Supported by the Science

The proposed permit and draft guidance endorse detention as a restoration measure. According to the draft Guidance: "By delaying one inch of rainfall over 24 hours, extended detention facilities improve the settling of pollutants and provide channel protection."[14] It is, however, impossible to read the National Research Council's 2008 report on stormwater, the scientific articles relied on in that report, EPA's interpretations, and later scientific work and not draw the conclusion that detention is now perceived by scientists to be an obsolete practice, to be used only in those rare circumstances when no other practices can be implemented. Detention

[12] Code of Maryland Regulations (COMAR) 26.08.04.02 (A) (2013).

[13]COMAR 26.08.02.07.

[14]Draft Guidance 4.

practices do not protect water quality as well as better practices and certainly do not protect the biological integrity of our rivers and streams. The reasons are many:

- Detention does not reduce the overall volume of polluted runoff, which means that it does not reduce the same mass of pollutants as better stormwater management practices such as ESD practices.[15]

- Detention may delay the peak flow from a particular site but in combination with the polluted runoff from detention systems at other sites across the watershed, the impacts of the volume are merely delayed and not mitigated.[16]

- Detention practices are often designed and constructed on an "ad hoc" or "site by site", basis without analysis of the appropriateness of the practice in light of the conditions in the watershed.[17]

- Concentrations of pollutants leaving detention ponds may be reduced but the volume of the stormwater flows leaving them keeps the masses of pollutants discharged high, and

[15]National Research Council. (2008). *Urban Stormwater in the United States*, Washington, DC: National Academies Press. "Mitigation of urban-induced flow increases have followed this narrow approach, typically by endeavoring to reduce peak discharge by use of detention ponds but leaving the underlying increase in runoff volumes—and the associated augmentation of both frequency and duration of high discharges—untouched. This partly explains why evaluation of downstream conditions commonly document little improvement resulting from traditional flow- mitigation measures (e.g., Maxted and Shaver, 1997; Roesner et al., 2001; May and Horner, 2002)." (page 33)

[16]EPA. (2010). *Guidance for Federal Land Management in the Chesapeake Bay Watershed, Chapter 3 Urban and Suburban* (EPA841-R-10-002). "Simply reducing the peak flow rate, and extending the duration of the predevelopment peak flow, is not effective because as the different discharge sources enter a stream, the hydrographs are additive, and the extended predevelopment peak flows combine to produce an overall higher than natural peak. The result is the pervasive condition of channel incising, erosion, and loss of natural stream biological and chemical function as observed in Figure 3-8." (page 3-17)

National Research Council. (2008). "Detention basins can control peak flows directly below the point of discharge and at the property boundary. However, when designed on a site-by-site basis without taking other basins into account, they can lead to downstream flooding problems because volume is not reduced (McCuen, 1979; Ferguson, 1991; Traver and Chadderton, 1992; EPA, 2005d). In addition, out of concerns for clogging, openings in the outlet structure of most basins are generally too large to hold back flows from smaller, more frequent storms. . . . Because of the limitations of on-site detention, infiltration of urban runoff to control its volume has become a recent goal of stormwater management." (page 341)

[17]National Research Council. (2008). "Past practices of designing detention basins on a site-by-site basis have been ineffective at protecting water quality in receiving waters and only partially effective in meeting flood control requirements." (page 457)

- Detention does not protect downstream channels from the erosive effects of stormwater volume which mobilizes sediments and destroys biota.[18]

As EPA has said:

[18]USEPA (2010). "Detention systems generate greater flow volumes for extended periods. Those prolonged, higher discharge rates can undermine the stability of the stream channel and induce erosion, channel incision and bank cutting." (page 3-17)

National Research Council. (2008). "It should be noted that there are important, although indirect, water quality benefits of all runoff-volume-reduction SCMs—(1) the reduction in runoff will reduce streambank erosion downstream and the concomitant increases in sediment load, and (2) volume reductions lead to pollutant load reductions, even if pollutant concentrations in stormwater are not decreased." (page 372)

See also:

Dietz, M. E., and Clausen, J. C. (2008). Stormwater Runoff and Export Changes with Development in a Traditional and Low Impact Subdivision. *Journal of Environmental Management* 87(4):560-566. This study concluded that a subdivision with LID controls controlled nitrogen and phosphorus as well as forested land in large part because of the volume of runoff that was controlled.

Emerson, C. H., Welty, C. and Traver, R. (2005). Watershed-scale evaluation of a system of storm water detention basins. *Journal of Hydrologic Engineering* 10(3):237-242. "This paper has quantitatively demonstrated that the stormwater management method of peak flow rate control now widely implemented is flawed when viewed in terms of the impacts on the main receiving water body of a watershed. This result points to the need for fundamental reevaluation of the basis for stormwater management if the goal is protecting natural resources on the watershed scale. Modeling results indicated that the volume-control approach shows promise for attaining this goal . . . " (page 241)

Ferguson, B. K. (1991). The Failure of Detention and the Future of Stormwater Design. *Landscape Architecture* 81(12):76-79.

Maxted, J. R., and Shaver, E. (1997). The use of retention basins to mitigate stormwater impacts on aquatic life. In L. A. Roesner (Ed.), *Effects of Watershed Development and Management on Aquatic Ecosystems* (pp. 494-512). New York: American Society of Civil Engineers. (Study of the areas downstream of eight stormwater ponds showed that the ponds were no better than sites with no controls in terms of protecting downstream aquatic life.)

McCuen, R. H. (1979). Downstream effects of stormwater management basins. *Journal of the Hydraulics Division* 105(11):1343-1356. ("If stormwater management is to be effective, stormwater management basins are going to have to be complemented with other stormwater management measures that more closely duplicate the storage characteristics of the predevelopment land use conditions. For example, grass-lined swales, rooftop detention, and porous pavement are stormwater management measures that provide storage that is more spatially representative of natural storage and more closely approximates the temporal distribution of storage depletion that existed prior to development." (page1356)

> Traditional stormwater management is very heavily focused on extended detention approaches, i.e. collecting water short-term (usually in a large basin), and discharging it to the receiving water over the period of one to several days, depending on the size of the storm. Extended detention practices are first and foremost designed to prevent downstream flooding and not to protect downstream channel stability or water quality. For decades, water quality protection has been a secondary goal, or one omitted entirely during the design of these facilities. Over time it has become apparent through research and monitoring that these traditional practices do not effectively protect the physical, chemical or biological integrity of receiving waters. Furthermore, operation and maintenance of these systems to ensure that they perform as designed requires a level of managerial and financial commitment that is often not provided, further diminishing the effectiveness of these practices from a water quality performance perspective. A number of researchers have documented that extended detention practices fail to maintain water quality, downstream habitat and biotic integrity of the receiving waters.[19]

Despite these credible scientific statements about the ineffectiveness of detention, Montgomery County has stated that about 80% of the "restoration" or retrofit projects they are implementing are detention and other gray infrastructure approaches. Until recently, Prince George's County indicated that about 80% of its restoration would consist of gray infrastructure. Given that the Anacostia TMDL states that 75% of the sediment in its Maryland waters is associated with stream bank erosion related to volume, practices that do not control erosive volumes of stormwater are not going to work well to reduce either sediments or to restore aquatic life.[20]

Other questionable practices endorsed by the proposed permit and draft guidance include the use of wet ponds to reduce nutrient pollution. The National Research Council opined that it was likely that plants would have to be harvested from wet ponds to achieve lasting nutrient

[19]EPA, Fact Sheet for District of Columbia (DC) Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Final Permit (October 7, 2011) available at http://www.epa.gov/reg3wapd/npdes/dcpermits.htm (last visited February 28, 2013) (page 11).

[20]MDE and DDOE, Total Maximum Daily Loads of Sediment/Total Suspended Solids for the Anacostia River Basin, Montgomery and Prince George's Counties, Maryland and The District of Columbia (2007) p. 11, viewed at http://www.mde.state.md.us/programs/Water/TMDL/ApprovedFinalTMDLs/Documents/www.mde.state.md.us/assets/document/AnacostiaSed_MD-DC_TMDL_061407_final.pdf

reductions, a practice that is virtually unheard of.[21] It has also been observed that wet ponds do not achieve runoff volume reduction.[22]

The Law Requires Permits to Reduce Pollutants to the Maximum Extent Practicable, Which Entails Using the Most Effective Stormwater Management Techniques to Reduce Pollutants and Prevent Violations of Water Quality Standards

MDE may argue that all it is required to provide for in MS4 permits is water quality treatment and not restoration, despite the need for restoration Maryland's streams and rivers described by the state itself though the fact that MDE persists in calling the required retrofits "restoration" shows that MDE believes restoration is needed. However, even one adopted this perspective, e.g. that MDE is only required by law to require "treatment," it is still required to provide for the best treatment available. The Clean Water Act requires not only water quality treatment, but that permits contain "controls that reduce pollutants to the maximum extent practicable."[23] There is a growing body of scientific evidence that indicates that Environmental Site Design (ESD) is the *best kind of water quality treatment*, reducing a greater mass of pollutants, as well as reducing volumes and providing for restoration of our streams. Indeed, an administrative hearing officer in Washington State has ruled that Phase 1 MS4s must utilize ESD due to the "maximum extent practicable" requirement of the Clean Water Act.[24]

---

[21]National Research Council. (2008). "Although there is debate, it seems likely that plants will need to be harvested to accomplish nutrient removal (Reed et al., 1998)." (page 401) See also Collins, K. A., Lawrence, T. J., Stander, E. K., Jontos, R. J., Kaushal, S. S., Newcomer, T. A., Grimm, N. B., and Ekberg, M. C. (2010). Opportunities and Challenges for Managing Nitrogen in Urban Stormwater: A Review and Synthesis. *Ecological Engineering* 36:1507-1519.

[22]Dietz, M. E. (2007). Low Impact Development Practices: A Review of Current Research and Recommendations for Future Directions. *Water, Air and Soil Pollution* 186:351-363.

[23]33 USC 1342(p)(3)(B).

[24] Puget Soundkeeper Alliance, et al. v State of Washington, Dep't. of Ecology (Puget Soundkeeper, 2008a), Findings of Fact, Conclusions of Law, and Order, Condition S.4. PCHB Nos. 07-021, 07-026, 07-027, 07-028, 07-029, 07-030, 07-037, Aug. 7, 2008. Available at http://www.eho.wa.gov/searchdocuments/2008%20archive/pchb%2007-021,026,027,028,029,020,022,023,030&037%20final%20summary%20judgment%20order.pdf

Puget Soundkeeper Alliance, et al. v State of Washington, Dep't. of Ecology (Puget Soundkeeper, 2008b), Findings of Fact, Conclusions of Law, and Order, Phase I. PCHB Nos. 07-021, 07-026, 07-027, 07-028, 07-029, 07-030, 07-037, Aug. 7, 2008. Available at http://www.eho.wa.gov/searchdocuments/2008%20archive/pchb%2007-021,07-026,07-027,07-028,07-029,07-030,07-037%20phase%20i%20final.pdf.

Both the draft guidance and the report of the Chesapeake Bay Program's Stormwater Working Group[25] concluded that runoff reduction measures achieve higher pollutant reductions than treatment practices.

A study of a project called the Jordan Cove Subdivision is extremely significant. The National Research Council called this subdivision one of the most extensively studied of all subdivisions in the United States. Jordan Cove is a subdivision that has both detention practices and Environmental Site Design (ESD) practices. The National Research Council found that while *concentrations* of pollutants were higher in the ESD subdivision, that the *mass* of pollutants discharged was dramatically lower, because of the greatly decreased volumes.[26] This study and others finds that ESD reduces pollutants more than detention practices.[27]

A recent review of the science related to bioretention found that "The link between runoff volume capture and quality performance is strong, and small storm capture is extremely effective." In addition to greatly reducing sediments and nutrients, this overview of the recent science found that bioretention was also effective at capturing metals, oil and grease and other hydrocarbons, and bacteria. The review concluded:

> Perhaps the main reason bioretention cells are more effective relative to other BMPs in removing water quality is their employment of several pollutant removal processes, including sedimentation, chemical sorption, biological activity (nitrification and denitrification) and heat transfer.[28]

Another study of particular interest is Professor Dietz's survey of stormwater science which concluded that ESD practices, especially bioretention, have been effective at reducing large volumes of runoff, mimicking the hydrology of the natural environment, and have consistently reduced pollutants very well.[29]

---

[25]Chesapeake Bay Program, Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects (long version) November 19, 2012, accessed at http://www.chesapeakebay.net/publications/title/stormwater_retrofits_expert_panel_report_with_appendices

[26]National Research Council. (2008). (pages 396-8)

[27]See the many studies cited in EPA, Fact Sheet for District of Columbia (DC) Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Final Permit (October 7, 2011) available at http://www.epa.gov/reg3wapd/npdes/dcpermits.htm (last visited February 28, 2013) that stand for the proposition that ESD reduces larger masses of pollutants than detention.

[28] Davis, A., W. Hunt, R, Traver, and M. Clar, (2009) Bioretention Technology, Overview of Current Practice and Future Needs. *Journal of Environmental Engineering*, March 2009 at 109-117.

[29]Dietz, M. E. (2007).

The Permit Itself Does Not Contain No Information About What Level of Pollutant Reduction Will Be Attributed to the Implementation of Various Restoration and Treatment Practices.

MDE states in the proposed permit that the permittee must "restore" a portion of its impervious surfaces and will receive pollution reduction credits against the permittee's Waste Load Allocation, but the amounts of pollution reduction that will be credited to the permittee is not provided for in the permit but instead are provided in the guidance. This is a critical element of the regulatory regime that MDE is establishing. MDE must include key standards in the MS4 permit itself. Principles of good government and the law require that fundamental requirements and standards for MS4 permits be in the final MS4 permits themselves and not in draft guidance.

There are many reasons for this. For example, the title page of the document indicates that the document is "guidance" and yet the proposed permit requires that restoration be consistent with it. This is confusing to the public and stymies their ability to participate. Is the draft MDE guidance merely guidance, or does it establish one of the most important standards in MDE's regulatory regime, the amount of pollutant reduction that is assigned to various retrofit projects?

Further, the law provides the County and other interested parties the right to have notice of, to review and comment upon, and to legally challenge the provisions of MS4 permits. By putting one of the most important element of regulatory regime in draft guidance, MDE appears to be attempting to side-step the procedural protections provided by law.

Further, the draft MDE guidance is apparently a "draft" as denoted on its cover page. If the document is a "draft," then presumably MDE may change it at any time. That aspect also deprives both representatives of the County and citizens of their ability to participate effectively in the various ways provided to them by law. They may they understand MDE's current guidance but MDE can change that without the process that the law provides for their participation.

Please note that it is not being suggested that MDE cannot provide helpful information to MS4s and others outside the four corners of its permits, but that key standards, such as the pollution reductions assigned to various stormwater retrofits implemented by the permittee, must be in the permits.

The Permit Refers to TMDLs and Wasteload Allocations for Pollutants other than Nutrients and Sediments But Neither the Permit or the Guidance Provide Pollution Credit Information for Other Pollutants

The proposed permit and draft guidance provide a complete regulatory program for only three pollutants: nitrogen, phosphorus, and sediment, disregarding the many other pollutants that are the cause of water quality impairments in Maryland. For example, the Anacostia River and watershed are impaired by bacteria, biological oxygen demand, polycyclic aromatic hydrocarbons (PAHs) and other toxics such as PCBs and mercury, biological impairment and trash. Maryland's waters also often experience high temperatures that are detrimental to wildlife and are exacerbated by detention ponds. Neither the permit nor the draft guidance discuss what pollutant reductions will be assigned to various programs and retrofits for pollutants other than nitrogen, phosphorus, or sediment. Nor does the permit or guidance give any information about what kinds of retrofit practices might reduce these other pollutants. Nor does it describe what practices should be implemented to address these other pollutants and the circumstances in which certain practices should not be used; for example, detention ponds that heat stormwater should not be used in a subwatershed impaired by high temperatures. Consistent with the law's requirement for the use of the best available practices that reduce pollutants to the maximum extent practicable, it is critical that the Permit and Guidance address all of the pollutants and problems associated with stormwater, and not just the pollutants reflected in Chesapeake Bay TMDLs.

MDE Allows Local Jurisdictions to Underestimate the Amount of Impervious Surfaces that Must Be Restored

The draft guidance states:

> Jurisdictions will need to determine the total impervious surface area that they are legally responsible for and delineate the portions that are either treated to the maximum extent practicable (MEP), partially treated, or untreated and available for retrofit. This assessment will provide the baseline from which the 20% restoration requirement may be calculated. A good place to start is 2002 because this is when Maryland regulations and local ordinances began requiring BMPs to address a specific suite of volumes [recharge (Rev), water quality (WQv), and channel protection (Cpv)] and it can therefore be justified that water quality treatment has been provided to the MEP.[30]

[30]Draft MDE guidance 8.

> Development after 2002 should not be counted toward impervious surfaces that need to be restored. BMPs from this stormwater program era are deemed state-of-the-art and need to be maintained, but will provide limited opportunity for water quality improvement.[31]
>
> As stated above, impervious area caused by development after 2002 will not be required to be restored provided that current State regulations are met. This is because the design criteria in the *Manual* results in more than sufficient stormwater management and there will be limited opportunity for improving water quality through retrofitting.[32]

As noted above, EPA literature, published scientific resources, Maryland General Assembly, and indeed, MDE in its press release, has indicated that the "state of the art" is ESD. Due to delays in developing the regulations implementing the Maryland Stormwater Act of 2007, MDE only adopted ESD requirements for development and redevelopment approved after May 4, 2010. Consequently, it does not seem accurate or logical to, as the proposed permit and draft Guidance do, pronounce that all areas developed after 2002 are "state of the art" and do not need to be restored. Much of the infrastructure implemented between 2002 and 2010 was based on detention and filters, which are not "state of the art"; these conventional practices are termed "standard" practices in the Stormwater Management Act of 2007, and are required to be used when "absolutely necessary." MDE is requiring "restoration" for impervious surfaces that complied with Maryland's 2000 Design Manual; the Manual was only updated to include ESD requirements in 2009.

The Guidance's Substantive Flaws Are the Result of Procedural Defects

The procedure that MDE used to develop the draft guidance explains many of the substantive flaws that undermine the Guidance's effectiveness. MDE has published the draft guidance on its website with very little input from stakeholders. No stakeholders were given any formal opportunity for input, and no scientific peer review has been conducted despite the relevance of current science to the topics covered. If MDE had developed the Guidance through a more formal rulemaking process that was open to public input, both the costs and benefits of various restoration practices would have been evaluated; such a holistic evaluation would have tended to favor ESD approaches that achieve a greater environmental benefit per dollar spent. In addition, as noted above, the Chesapeake Bay Program has published its own report representing, presumably, the

[31]Draft MDE guidance 8.

[32]Draft MDE guidance 7.

federal government's views on the pollution reduction credits to be given for the implementation of various stormwater practices for nitrogen, phosphorus, and sediment. This report is somewhat of an improvement over the draft guidance but suffers many similar defects: there was no opportunity for input from the public, no scientific peer review was conducted, and it does not address pollutants other than nitrogen, phosphorus, or sediment.

To have a complete regulatory regime to protect the Bay and local water bodies, MDE needs a clear, complete and scientifically-cogent picture of how the implementation of various retrofit practices will be credited against TMDL waste load allocations for all stormwater pollutants for which it has issued TMDLs. This should be included in its MS4 permits or in a rulemaking, with opportunity for the public to comment and challenge it legally.

The commenter strongly suspects that if MDE (or EPA) were conduct a review of various stormwater management practices, evaluating the mass of pollutants removed by various practices rather than the concentrations in their discharges, it would soon be clear (as the body of scientific literature on stormwater indicates this) that reducing volumes of stormwater discharged and reducing pollutants are fundamentally linked. Reducing volume is the same as reducing pollutants. Given this, and the limited practicality of monitoring the mass of pollutants in discharged stormwater, this evaluation would quickly come to the conclusion that the simplest and best way to reduce stormwater pollution and destruction of the Bay and its tributaries with accountability and scientific validity is to use stormwater volume reduction as a surrogate for pollution reduction. Such an exercise would also quickly ascertain that many pollutants are not effectively removed by detention or filtration and the best approach for limiting their impacts would be to prevent reduce the volume of stormwater discharges.[33]

[33]See EPA's comments in the Fact Sheet on the District of Columbia's permit referenced above, at page 12: "The NRC Report points out the wisdom of managing stormwater flow not just for the hydrologic benefits as described above, but because it serves as an excellent proxy for pollutants, i.e., by reducing the volume of stormwater discharged, the amount of pollutants typically entrained in stormwater will also be reduced. Reductions in the number of concentrated and erosive flow events will result in decreased mobilization and transport of sediments and other pollutants into receiving waters. The NRC Report also noted that it is generally easier and less expensive to measure flow than the concentration or load of individual pollutant constituents."

MDE should withdraw this Guidance and convene a balanced stakeholder panel that includes respected stormwater scientists and practitioners, who can provide information on the costs, benefits, and feasibility of restoration practices. As noted above, such a panel would likely quickly come to the conclusion that the best and most cost-effective approach to restoration is the use of ESD practices that reduce stormwater volume and thereby reduce the most pollutant mass.

Conclusions

Given the prevailing scientific view that detention and wet ponds do not work well and that ESD approaches that control volume are more effective at both reducing pollutants and restoring streams, the proposed permit should be revised to require restoration practices that reduce 1 inch or more of stormwater volume using ESD. It may not be practicable for MS4 jurisdictions to retrofit 20% of their poorly managed impervious surface using ESD in each MS4 permit term. But surely the use of practices supported by the science is what is needed, even if it takes a longer period of time.

Thanks very much for your consideration and for your ongoing work to restore the Bay and our urban rivers and streams that are so polluted, like the Anacostia.