Proposed Readoption and Amendment of NJ Stormwater Management Rules, NJAC 7:8

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Emailed to: DWQ-BNPC-OPRA@dep.state.nj.us

Comments from the Delaware Riverkeeper Network regarding Proposed Readoption and Amendment of NJ Stormwater Management Rules, NJAC 7:8

Thank you for the opportunity to comment. We agree that taking this time to strengthen and clarify the Stormwater Management Rules is important.

While the Department does not want to take on controversial items at this juncture, there are some important fixes that need to be made in the current rule.

1. UPGRADE TO THE BUFFERS REQUIREMENT

Forested Buffers Requirement
Rather than providing 50 foot buffers as the statewide minimum for streams that are not in the C-1 Category, we urge you to upgrade this width to come into line with the science. The science is increasingly demonstrating that 100 foot forested buffers are the minimum necessary to provide all of the benefits that a streamside buffer can provide at a meaningful level. Therefore we urge the statewide minimum for non-C-1 streams to be 100 feet and that the plant composition of be that of a forest.

The Stroud Water Research Center is on the cusp of releasing a comprehensive paper demonstrating the import of the 100 foot forested buffer width. In fact, as we understand, based on their review of the all of the science they will be recommended 100 feet forested with an additional width of vegetation. But already there is a wealth of scientific data available to demonstrate the water quality and quantity values of 100 foot forested buffers.

Prevention of flood-related damage by storing flood waters
Tourbier (1994) noted that buffer systems in conjunction with LID practices work by utilizing natural processes to provide significant detention through depression storage and infiltration. As a result, peak rate and volume of post-construction runoff can often be reduced dramatically.

Decreased need for stormwater infrastructure
Building upon the work of Tourbier and others, research has consistently concluded that because of the

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hydrological impacts of buffers, those areas which preserve and restore such systems may require less or smaller sized stormwater infrastructure, such as detention basis. (Miller and Sutherland, 1999) This fact is widely recognized and many state and local stormwater management programs, including Pennsylvania's, allow for the "crediting" of stormwater that is discharged to intact buffer systems.

Trapping and filtering sediment, nutrients, and other pollutants from runoff
Numerous studies have concluded that buffers, particularly forested varieties, provide significant removal of aquatic contaminants, including toxics. While site specific conditions dictate the effectiveness of such systems, many researchers have concluded that buffers can remove upwards of 80 to 90% of such contaminants when equal or greater to 100 feet in width. See summary table below.

For instance, Lowrance (2001) found that for nitrogen, the smallest buffer (15 ft) provided a 5% reduction, while the widest buffer (170 ft) exceeded a 95% reduction. Nitrogen content from the narrow buffers (15 ft to 100 ft) was mostly nitrate; the wider buffers had an even division of nitrate and ammonium. As the buffer width increased, the amount of organic nitrogen as a percentage of the total runoff also increased. A switch from inorganic to organic nitrogen is likely to be beneficial to the aquatic system because organic nitrogen is not as easily utilized by harmful algal blooms. For phosphorus, the smallest buffer (15 ft) was effective, reducing 62% of the load; however, the widest buffer (170 ft) removed 90% of the total phosphorus load. Sediment reductions were also dependent on buffer width. Sediment reductions increased as buffer width increased, up to a 90% reduction for a buffer width of 55 ft. It is notable, however, that Lowrance described the sediment load from the adjacent land as "low" and not of "a level of input that would stress the sediment load reduction capacity of the buffer." One would expect that land with a greater susceptibility for erosion would necessitate a wider buffer.

A 2003 study by Vellidis et al. examined a restored forested riparian wetland (average width of 125 feet) that was buffering an area of manure application and a heavily fertilized pasture. This three zone buffer removed 66% of total nitrogen and 59% of total phosphorus. Significantly, this research indicates that "within the first eight years following restoration, restored areas can retain large masses and high percentages of the nutrients entering."

Summary of Select Studies Reporting Percentage of Pollutant Reductions Based on Buffer Size

		% Reduction based on Buffer Size:											
		~15 ft (4.6 m)			~35 ft (10.7 m)			~100 ft (30.5 m)			> 100 ft (> 30.5 m)		
Study	**Year**	**N**	**P**	**S**	**N**	**P**	**S**	**N**	**P**	**S**	**N**	**P**	**S**
Vellidis *et al.*	2003										66%	59%	
Lowrance *et al.*	2001	5%	62%	60%	50%	65%	80%	80%	80%	90%	95%	90%	90%
Lowrance *et al.*	1995	4%	29%	61%	23%	24%	75%	80%	77%	97%			
Schwer & Clausen	1989							76%	78%	89%			
Magette *et al.*	1987	17%	41%	72%	51%	53%	86%						
Barker & Young	1984										99%		
Young *et al.*	1980							87%	88%				

Enhanced in-stream uptake and sequestration of nutrients and other pollutants
Research by the Stroud Water Research Center has concluded that forested buffer systems, as opposed to grassed systems, provide enhanced in situ (instream) contaminant sequestration and degradation primarily due to increased biological activity. The researchers noted that increased nitrogen attenuation and pesticide degradation were particularly associated with forested stream buffers (Sweeney et al., 2004).

Reduced stream bank erosion
The root systems associated with vegetated buffers protect and support the banks and other critical parts of a stream's morphology, allowing it to resist erosive forces and remain stable. The vegetation's roots hold the riparian lands in place, maintaining the hydraulic roughness of the bank, slowing flow velocities in the stream near the bank. Root systems of woody shrubs and trees do a better job of anchoring soils- a function turf grass cannot do effectively (NRC, 2002).

Enhanced habitat for fish and other aquatic organisms by moderating water temperatures Buffers also regulate stream temperature through shading, important for healthy habitat. Studies have concluded that removal of streamside vegetation can result in a temperature increase of 6 to 9 degrees Centigrade (Leavitt, 1998). A Pennsylvania study found increases from 4 to 9 degrees Fahrenheit which is the equivalent of moving the stream over 400 miles south (Klapproth, and Johnson, 2000). Also, riparian vegetation moderates stream temperature reducing the daily and seasonal fluctuations in stream temperature. The heating up of a stream reduces the oxygen carrying capacity of the waterway, harming stream life that is temperature-sensitive. Klapproth and Johnson also noted water temperatures are important in regulating phosphorus concentrations when water reaches above 60 °F, phosphorus is more readily released from its sediment hosts and dissolved into the stream as a pollutant. Increased water temperatures also produce heavy growth of filamentous algae (from increases of 9 °F), encourage the growth of parasitic bacteria, and can adversely affect benthic organisms.

Meyer et al. (2005) noted that not only the presence but also the size of forested stream buffers have a profound impact on a streams ability to support trout populations. Researchers found that when forested buffer widths were reduced from 100 feet to 50 feet, stream temperatures increased 2.9 °F to 4.2 °F while fine sediments increased 11%. Although these changes may appear small numerically, they resulted in an 81-88% reduction in young trout populations.

Clearly, protecting existing and restoring lost forested stream buffers will have profound impact on the health and integrity of waters of the State. We believe that the science supports an expanded set of requirements to assure ecological integrity and restoration while sustaining, and even enhancing, economic activity. To that end, we recommend the following:

We recommend all streams be afforded a minimum 100 horizontal foot forested buffer extending from the top of the stream bank on either side of the stream (unless the flood-plain exceeds this distance, in which case, the floodplain area is used), with additional areas as outlined below:

- First and Second order streams: An additional 50 feet from the top of the bank would be required to more fully protect these vulnerable but very valuable waterways.

C-1 Waters: Would of course retain the full 300 foot level of protection already in place in the regulations.

- Steep Slope: Additional distances would be added based on the following formula: add 10 feet if slope is 10-15%; 20 feet if slope 16-17%; 30 feet if slope is 18-20%; 50 feet if slope is 21-23%; 60 feet if slope is 24-25%; and 70 feet if slope exceeds 25%.
- In areas where development is proposed and a forested buffer does not exist, The regulations should require full restoration using native plant species.

- In areas where there are Threatened & Endangered Species concerns, irrespective of the size and vegetation type requirements for buffers, the Department shall ensure that buffers are of a size and vegetation type necessary to protect state or federal threatened or endangered species and their habitat. To meet this requirement, buffers may be wider than the minimum widths or be maintained in a vegetation type other than woody vegetation.
- Areas containing Impaired Waters: Developers in impaired waters could have the option of either choosing to extend the buffer an additional 50 feet from the top of the bank beyond the other requirements or to implement the following improvements in the buffer area and in the developed area adjacent to it:

o Improvements to the buffer area:

- 50% or more of trees planted in the buffer must be of two inch caliper or greater, and tree species composition should consist of a diverse mix of native tree species planted in the proper hydrologic zone as listed in Appendix B of the Pennsylvania Stormwater BMP Manual.
- Applicants must develop and implement an operation and maintenance plan for the buffer to be approved by DEP. The O&M plan must require maintenance activities for a minimum of 5 years, include measures to control invasive species, deer and rodent damage, and require replacement of all deceased trees for a minimum of the first 3 years.
- Applicants must provide permanent protection of riparian buffer area by placing a conservation easement on the property.

o Improvements to adjacent area:

- Achieve no net increase in pre-development to post-development volume, rate and concentration of pollutants in water quality using alternative site design, low impact development principles such as limiting disturbance, infiltration BMPs and other environmentally sound stormwater BMPs.
- Through deed restriction for all lots sold and as a condition of any final land development plan approval, ban the use of fertilizers, pesticides, herbicides or other chemicals on lawns and other portions of the property, except that herbicides may be used for invasive species control in riparian buffers if part of an O&M plan approved by DEP.
- Developments must replace any trees removed during the development process with the caliper of removed trees approximately matched by the sum of the caliper of replacement trees (i.e. four 3 inch trees replace one 12 inch tree).

We also believe that a forested buffer be defined as: An area of diverse species of native woody vegetation (trees and shrubs) that is adjacent to a body of water which is managed to maintain the integrity of stream channels and shorelines, to reduce the impact of upland sources of pollution by trapping, filtering, and converting sediments, nutrients, and other chemicals, and to supply food, cover, and thermal protection to fish and other wildlife. A riparian buffer area is considered forested if the existing vegetation consists of at least 66% woody vegetation.

2. Nonstructural Strategies

We support the Department's proposal to strengthen the mandatory use of nonstructural strategies for stormwater management. The Non-Structural Stormwater Strategies Point System (NSPS) is a good incentive to encourage this approach and to compliment the mandatory nature of the requirement.

However, we are concerned about certain built-in assumptions and premises in the Point System that compromise its intent. We are encouraged to see that the Department is considering the refinement and revision of the NSPS but we are concerned that it is not listed as an anticipated change. We urge the Department to revise and refine the NSPS.

Problems with the NSPS include:

- The use of the Natural Resource Conservation Service's Runoff Equation and a Runoff Curve Number (RCN) variation is used to calculate the point value of a site in regards to groundwater recharge. The land cover and soils that are present determine the recharge characteristics of a site. The use of these Land Use/Land Cover values need to be adjusted in order to accurately address impervious cover and to not allow a developer to take credit for not disturbing wetlands and stream buffers, which under law are off-limits already. Please see "Non-Structural Stormwater Strategies Point System - A Primer", by Margaret Y. Snyder, P.E.

- The use of TR-55 to estimate runoff and the Rational Method at 5.6 to estimate infiltration compounds runoff calculation problems. As is stated by the Natural Resources Conservation Service: "The rational method is very simple in concept but relies on considerable judgment and experience to evaluate all factors properly. It is used primarily for small drainage areas (less than 50 acres). The NRCS method is more sophisticated hydrologically and offers a more accurate approximation of runoff, particularly for areas larger than 20 acres. Choice of method for small areas depends primarily on the experience of the designer". (8.03, Appendices, New Rational Method)

We question the ability of "sophisticated" judgment to be applied through the current calculation methods. The assignment of values is not based on current research or information. There is no required soil testing for compaction after development and no predevelopment soil testing required to verify that accurate runoff numbers are being employed. The result is that certain land cover, such as lawn, is miscalculated -- runoff is underestimated because recharge is overestimated. Conversely, land cover such as forest is not credited accurately with the infiltration it provides. Calculations based on these assumptions lead to inadequate protection and utilization of natural land cover, particularly forests, as nonstructural strategies and lead to more and faster runoff to the stream when lawn is used. Similarly, there is no incentive to use meadow over turfed lawn due to incorrect runoff values. Please see letter from Leslie Sauer and others, care of ANJEC, 2.8.08.

3. Exemptions/Waivers

While we understand the rationale for removing "stream cleaning" from the requirements of the regulations, removing obstacles for damaging stream reaming projects like those we saw in New York in response to the floods of 2006 is a concern. "Cleaning" out streams, removing debris, scouring out banks, removing streamside and instream vegetation are inappropriate responses to flooding - they do not make the flood situation better and in fact make it worse. Therefore, we urge you to consider carefully whether granting this exemption to stream cleaning is actually advancing a flood response/stormwater runoff response that is harmful and that you do not intend.

4. Groundwater Recharge

We continue to be concerned about the Department's failure to give credit for recharge volumes from an infiltration basin. Failure to provide credit for recharge that is happening from an intended infiltration basin results in unnecessarily large basins, resulting in more earth disturbance, vegetation removal, and harm. In order to encourage the use of infiltration systems it is important that we provide proper credit for their contribution to groundwater recharge and reducing stormwater runoff.

We are also concerned about the misapplication of the Department's prohibition of recharging stormwater from areas of high pollutant loading and/or industrial stormwater exposed to "source material" at 7:8-5.4 (a) 2iii. This section is being implemented in the field to exempt new gas stations from stormwater recharge requirements. This is a big mistake that is negatively impacting streams and is missing the opportunity for groundwater recharge for new development with high amounts of impervious surface.

By way of example, an application for a Wawa gas station in Hunterdon County was expected to be routinely waived of any recharge requirements due to the expected presence of hydrocarbons on the site. In this instance, the runoff would impact a Category One waterway, a public lake. (Block 21, Lots 15 and 16, State Route 31 and County Route 579, Wawa, Inc. application for preliminary and final site plan approval and conditional use approval with variances for Wawa convenience store and gas station, local approval has not yet been granted as of this date)
Based on the erroneous assumption that stormwater from a convenience store and gas station cannot be successfully filtered and cleaned so as not to pose a water quality threat to groundwater, major development is moving forward without adequate recharge requirements throughout the state. Whereas these sites may individually not contribute large amounts of groundwater recharge, they almost always meet the definition of major development and in a subwatershed or watershed, the cumulative impact of lost recharge and the increase in volume of runoff that results (even if peak rate is controlled, volume is not) can be significant. Certainly, it should not be a matter of DEP policy to automatically waive gas station/convenience stores under this section. In fact, the NJ Stormwater Best Management Practices Manual lists suspended solids, nutrients, metals, hydrocarbons, and bacteria as pollutants that bioretention systems are used to remove (NJ Stormwater Best Management Practices Manual, Chapter 9.1, Standard for Bioretention Systems, Purpose). Effort should be made to employ best management practices to treat quality as well as quantity so that the most effective stormwater management strategies can be employed on these development sites, which seem to be prolific.

5. BMPs on Private Property
It is critical that the Department immediately include a mechanism for tracking BMPs on private property so that efforts can be taken to monitor their protection and progress. A database that tracks the location with address and GIS should be created, with a mandatory requirement that permittees provide this base level of information on their projects.

6. DEP Review and Consistency in Jurisdictional Areas; Clarify Requirements for Agricultural Developments
We support the Department's stated goal of improving consistency in jurisdictional areas and other areas of the rules within the Stormwater Management Act and the Flood Hazard Area Control Act. There are other basic jurisdictional issues that also need immediate attention in this readoption.

It is critical that the regulations make clear that the Municipality has an obligation to conduct their own local review of projects for compliance with the stormwater regulations, and that DEP also has its own obligation to undertake a review for compliance with the regulations. Each decisionmaking body has specific review responsibilities, different overarching goals, base of knowledge and opportunity for effective public and expert input - neither should be done to the exclusion of the other. There has been significant legal debate and harm done as a result of the confusion over who is to do the review and the one entity or the other abdicating its review responsibility. It is important we don't continue this misunderstanding and inappropriate application of the law.

An example of this confusion is a commercial farm operation. Specifically, David den Hollander's commercial horticulture operation in Franklin Township, Hunterdon County, has a history of intransigent stormwater runoff problems to the Lockatong Creek, a tributary to the Delaware River, classified under NJAC 7:9 B as a Category 1 stream. Mr. den Hollander has recently expanded his operations ("Quakertown Farms LLC") to another site within the Township (Block 49, Lot 15) that was certified as a commercial farm on June 11, 2009. Franklin Township contends that the municipal stormwater management plan and ordinance should be applied to this operation and its activities there. The attorney for Mr. den Hollander argues that because Mr. den Hollander has applied for a land use permit from the Department that the Department has sole responsibility for stormwater management for the entire site. This question is being debated now, with a continuance into July.

It was clear from testimony and discussion at the Hunterdon County Agricultural Development Board Hearing (CADB) on June 11 where this issue was hard that there is poor understanding of the jurisdictional roles of the State and the municipality and the result is environmental harm to the environment, particularly to the

Lockatong Creek. The argument about stormwater management and jurisdiction aired at this CADB Hearing is similar debates and legal filings between Franklin Township and Mr. den Hollander that have dragged on at least since 2003. The large amounts of impervious cover on the existing and proposed operations result in large quantities of stormwater runoff and pose intractable water quality issues as well (80 acres of new greenhouses are being proposed for the new site, the existing sites are approximately 80% impervious, including plastic mulch surfaces). A clear assignment of responsibility and jurisdiction, both when a DEP land use permit is required and when it is not and also when large amounts of impervious cover is present is sorely needed.

7. Nutrients

We consider nutrients, including nitrogen and phosphorous, to be major pollutants that can be addressed by stormwater best management practices and the requirements to remove nutrients needs to be strengthened. Considering that nutrients are a persistent and significant nonpoint source of pollution, it is a missed opportunity that needs to be employed if New Jersey is going to address nutrient loading in our rivers and Bays.

8. BMP Committee

The Delaware Riverkeeper Network would like to be part of the BMP Committee that is being established to update a portion of the BMP Manual.

9. Grandfathering

At the public meeting on June 4, 2009 representatives for builders asked that grandfathering under the regulations extend further back to activities that precede the receipt of any actual approvals or permits, and include the design phase of projects. The Delaware Riverkeeper Network absolutely opposes extending the grandfathering that is already included in the regulations and certainly would actively oppose any grandfathering that preceded official reviews and approvals for a project.

10. Brownfields

It is a concern that DEP is looking to exempt brownfields sites from the requirements of the program, whole cloth. As raised at the public meeting, capping projects and similar "covering over" of contaminated sites often result in a tremendous amount of additional impervious cover and therefore volume of runoff. It is important the program not whole cloth exempt such projects/proposals from review, and maintains the opportunity to review such projects to find opportunities for capturing and reducing, managing and/or treatment of stormwater runoff, providing for exemptions as appropriate as opposed to whole cloth exclusion.

Thank you for the opportunity to comment.

Yours sincerely,

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