

## MEMORANDUM

To: Rivanna River Basin Commission  
Technical Advisory Committee  
From: Ridge Schuyler  
Re: April 16: Follow-Up

June 25, 2008

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Given the amount of work each of us is required to juggle just to keep from falling further behind, it can be difficult to keep track of where we stand on the issues being addressed by the Rivanna River Basin Commission. I wanted to take this opportunity to share with you my perspective on where we are and where we seem to be heading.

The Commission has taken a major step forward in identifying scouring streamflows as a major source of the excessive sedimentation which poses the most serious threat to the health of the Rivanna watershed. We are now wrestling with the action steps we should take to begin to abate this threat.

As we have grappled with this issue as a Commission, both the Commonwealth and the localities comprising the Commission have been addressing similar issues.

For example, the Virginia Department of Conservation and Recreation is spearheading an effort to rewrite the state's stormwater management regulations. As you can see from the attached DRAFT of those regulations (which are a long way from being adopted), there is a recognition that our objective in stormwater management is to replicate the forest function—or more precisely, to ensure that the energy of water coming from a developed site does not exceed the energy of water that would have flowed off the site if it had remained in a good forested condition. This new approach raises a question about whether such a result is achievable, both technically and economically.

The county of Albemarle and the City of Charlottesville have just adopted resolutions, prompted by the need to expand the community's water supply, calling for greater conservation of treated drinking water and for a heightened effort to stop excessive sedimentation from filling up the South Fork Rivanna Reservoir. The source of that excessive sedimentation, of course, is the same source of the excessive sedimentation that is suffocating the life out of streams throughout the watershed, not just on the South Fork of the Rivanna.

The City of Charlottesville is exploring the possibility of adopting a stormwater utility, which would charge a fee to all landowners based on impervious cover to raise funds to address stormwater infrastructure needs in the City. The City is also trying to reduce its carbon footprint to address the issue of global climate change.

Fluvanna County is building a new high school, and both Greene and Fluvanna are dealing with how to reduce the environmental impacts of the new development that is

still occurring in those counties, despite the economic downturn. There are developers in all four localities who have expressed an interest in reducing their ecological footprint.

It seems to me that the Commission could play a crucial role in addressing these separate but related initiatives by filling in some notable research gaps:

- 1) Developing technical specifications for rainwater harvesting systems. Rainwater harvesting can provide multiple benefits, making it one of the most promising stormwater management tools. It captures water from a 100% impervious feature (the roof) and can be made to replicate forest function either through infiltration or evaporation. If used for lawn irrigation, it infiltrates while conserving treated drinking water. (EPA estimates that at least 30% of our treated drinking water gets sprinkled on our lawns). If returned to the roof as a fine spray, it evaporates while cooling the roof, thereby lowering the carbon footprint of the structure (we think). And if used for other potable or non-potable uses, it further conserves water reducing the strain on our water supply systems. One of the impediments to widespread use of rainwater harvesting systems is the lack of technical specifications that would allow a developer to determine easily what size tank is required for a given roof size and intended purpose (like lawn irrigation or home cooling). Overcoming this obstacle to implementation is critical to making this stormwater management tool more feasible. Sizing matters because the greatest expense of a rainwater harvesting system is the tank, and thus to keep the systems affordable, the tank needs to be sized optimally, providing the homeowner benefit of the harvested rainwater while also ensuring that the tank is available to capture the rain events necessary for meeting its stormwater management objective. The Nature Conservancy has already convened one meeting to begin developing these technical specifications, but more work needs to be done, which will require resources. Advancing the knowledge and thus the use of rainwater harvesting systems will help the Commonwealth determine the extent to which this practice can help make their proposed stormwater management regulations feasible, it can help meet water conservation objectives, it can perhaps provide a means of reducing the carbon footprint of structures, and it can make it easier for new development to reduce its effect on scouring streamflows. (Short term goal)
- 2) Working with developers to improve site plans to address scouring streamflows. A number of developers have expressed an interest in reducing their ecological footprint, but don't know how best to achieve the objective. The Rivanna River Basin Commission's Technical Advisory Committee, perhaps acting through paid outside help, could provide recommendations to developers about how to reduce the effect of the proposed development on our rivers and streams. These recommendations would go beyond the promotion of rainwater harvesting systems, and would look at the full range of low (or no) impact development practices (like environmental site design) to demonstrate the feasibility of these approaches. (Medium term goal)
- 3) Determining the extent to which eliminating (or reducing) the effects of new development restores the health of the watershed. New stormwater management

practices, even if they prove affordable and acceptable, will likely only affect new development. Since some of that new development will no doubt occur on land that has already been converted from forest, then replicating the forest function on that property should provide at least some improvement in streamflow. We need to determine what else, if anything, would need to be done to protect the watershed. Specifically, we need to determine whether we need to develop strategies that will reduce the energy of water flowing off of agricultural lands, whether we need to promote more stormwater retrofits on existing development, and the extent to which we need to restore already degraded streams, which may continue to contribute excessive sedimentation even when natural streamflows are restored. (Long term goal)

In my view, if we advance our understanding on these three topics, we will be making huge strides in our efforts to determine the most feasible way of protecting a watershed from the threat of excessive sedimentation. And the lessons learned here could then be exported throughout the Chesapeake Bay watershed and beyond.