Your Water, Your Future
by Dauphin County Conservation District

Dauphin County's Stormwater Publication for Municipalities
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DEVELOPMENT: MINIMIZING THE IMPACTS

This issue of *Your Water, Your Future* continues our exploration into new, environmentally sensitive approaches to development. Environmentally sustainable development can reduce or eliminate negative impacts to water resources caused by conventional development. These impacts were featured in issue five.

Courtesy of the LID Center

Advances in the field of stormwater management have fostered the design of new and better approaches to development that protect local natural resources, especially water quality. The traditional way of developing land – also known as conventional development – causes a host of water resource problems. This approach to growth and development is a legacy of the past; for our future, we must look to managing development in a way that benefits our citizens and our communities' natural resources. This begins with rethinking the way our communities grow and develop.

Better Development Strategies

How familiar are you with the terms *Better Site Design*, *Open Space Design*, *Low Impact Development*, and *Conservation Design*? These are fast becoming key concepts in the field of stormwater management. They are comprehensive strategies that seek to minimize the adverse effects of development on our land and water resources. The tools used by design engineers to apply these strategies are known as Best Management Practices, or BMPs. There are two categories of BMPs, structural and non-structural.

Non-Structural BMPs

Non-structural BMPs are strategies and methods of planning and site design employed to minimize the impacts of stormwater runoff from new development. These BMPs are integrated into local land use regulations such as zoning or subdivision and land development ordinances. Examples include maximum impervious cover limits, relaxed frontage and setback requirements and site design flexibility to allow smaller lots, and preserving open, pervious space to reduce runoff volumes and provide water quality benefits. Another example is the preservation of critical areas such as wetlands, riparian buffers and floodplains.

(Continued on reverse)

Quiz - True or False

1. Capital costs associated with clustered development are the same as costs for conventional development.
2. A study reported that nutrients in runoff declined by 45% to 60% when two conventional subdivisions were redesigned as open space subdivisions.
3. A national study of 10 programs that diverted development away from flood-prone areas found that land next to protected floodplains had increased in value.
4. Structural BMPs are constructed devices that detain, retain, filter and infiltrate runoff.

Answers on reverse side.

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Please contact Gil Hirschel at 921-8100 regarding questions, comments, and requests for additional information.

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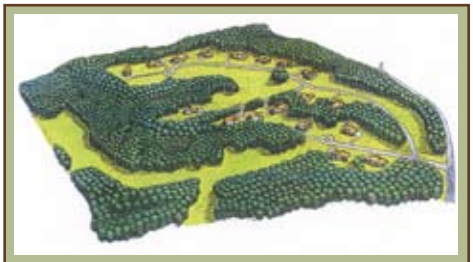
BMPs in Action!

DCCD invites you to our demonstration tour of structural BMPs. The self-guided tour features 16 BMPs, including porous paving, a rain garden and inlet treatment. Maps are available outside the back entrance to the building. Fact sheets about each BMP are available on our website, www.dauphincd.org.

We will also be offering a guided group tour for municipal officials and staff - details will be posted in an upcoming issue!

Non-Structural BMPs *(cont.)*



Sketch of development design that preserves open space.
Courtesy of The Natural Lands Trust

The goal is to integrate better stormwater management and water resource conservation into the design process from the beginning of the design process, rather than as an afterthought.

Preservation of open space through compact or clustered designs allows for natural infiltration and filtration of runoff. These methods of development may be required by local ordinances or they can be allowed as alternative development designs. Conventional development ordinances, which often have the effect of maximizing runoff, may make it more difficult for developers to meet the ever-increasing state and federal regulations governing stormwater management. The developer may be caught between local ordinances that do not allow the flexibility needed to minimize the volume of runoff generated and regulations that require the generated volume to be managed.

Structural BMPs

Rain Gardens (top) and porous asphalt are structural BMPs that infiltrate runoff.

Structural BMPs are constructed devices that detain, retain, filter and infiltrate runoff. Examples of these are bioretention basins and rain gardens, which add a stormwater treatment component to landscaping features on the development site. Surface runoff diverted to structural BMPs is treated for water quality, infiltrated to reduce runoff volume, or retained or detained to reduce peak discharges.

There are many different kinds of structural BMPs, which allow site designers flexibility in meeting stormwater management objectives in a wide variety of settings. When they are properly incorporated into the site plan, structural BMPs are an effective means of achieving the common goal of enhancing water quality.

Cost Benefits

Compared to conventional subdivisions, environmentally-sensitive development can lower capital costs by 10 to 33 percent, due to fewer infrastructure costs. To illustrate, siting a house closer to the road reduces the length of its driveway, which lowers paving costs and adds the environmental benefit of creating less impermeable surface area.

Preserving land for open space in a cluster scenario also reduces costs for clearing and grading land by 35 to 60 percent, while it achieves reductions in total impervious cover by 10 to 50 percent. A report by the Center for Watershed Protection on the redesign of two conventional subdivisions into open space subdivisions indicated a significant reduction – 45 to 60 percent – in the amount of nutrients carried in runoff leaving the site.

From an economic perspective, studies show that homes in a cluster development setting consistently sell for a higher value than homes in conventional subdivisions.

Water Quality Benefits

The adverse impacts of under-managed stormwater discussed in Issue 5 can be minimized or eliminated by employing innovative concepts in managing development. The benefits of environmentally-sensitive design include reductions in runoff volume, which minimizes flooding impacts, especially to floodplains. A national study of 10 programs that diverted development away from flood-prone areas found that land next to protected floodplains had increased in value by an average of $10,427 per acre!

Using structural BMPs to infiltrate runoff also reduces streambank erosion and helps maintain an adequate supply of groundwater. Concerning pollutant removal, a number of BMPs are designed to filter stormwater runoff on the site before it reaches waterways. These BMPs help protect aquatic habitat by preserving water quality in the stream. BMPs also enhance the aesthetics of local communities, as they simulate natural processes and often use natural materials in place of infrastructure, such as drains, pipes and outlets.

Municipal Action

Whether your municipality is developing rapidly or slowly, the time to act is now. A proactive approach is more beneficial than a reactive approach, as it may result in cost savings prior to development and over the long term, in maintenance and infrastructure costs. Studies show that it is more expensive to retrofit BMPs after development has occurred.

Effective site planning can be facilitated by municipal ordinances that allow flexibility in site design and layout or clustering development to avoid intruding on sensitive areas or natural drainage features. Fortunately, a number of municipalities in the county have stormwater management ordinances based on Act 167 stormwater management planning. Enforcement of these ordinances can go a long way in protecting water resources and ensuring livable, attractive communities. By rethinking the conventional approach to development, our communities can continue to grow, and at the same time, minimize the issues and costs associated with stormwater problems. □

Next Issue: A Word from our Partners

Quiz Answers

1-False; 2-True; 3-True; 4-True