

CHARTIERS CREEK

WATERSHED ASSOCIATION

WINTER, 2010

Vol. 7, #4

INSIDE THIS ISSUE:

QUESTION: HOW DO WE
MANAGE STORMWATER IN
DEVELOPED AREAS?

2, 3

ChCWA ACCEPTED FOR MAJOR NEW PROJECT

The Chartiers Creek Watershed Association has been selected as one of the watershed groups to take part in a new project of the Western Pennsylvania Conservancy. The project "will provide comprehensive technical and scientific assistance to four watershed organizations over the next two years." The project is valued at about \$35,000 for each group.

We will have more to say later, as we learn just how the project will proceed.

PLANNING FOR 2010

What else is ahead for 2010? To some extent—more of the same. The Wetlands Walk at the North Franklin Wetlands, displays and conversations at Ag Days and the Washington County Fair, continuation of the stream monitoring projects, our quarterly newsletter and the Association's website—all are on the schedule for this year.

The possibility of a special fall meeting on a topic of current interest was also proposed at the Annual Meeting in December. Plans will be firmed up at the regular ChCWA meeting on January 13.

The election of 2010 officers and directors was also held in December. Serving for the current year will be:

President: Susan Morgan
Vice-president: Josh Dunkle
Secretary: Carrilee Hemington
Treasurer: Joan Jessen
Directors: Sheila Burcin, Tom Hart,
Barbara Rosensteel, and Virginia McAnulty.

CELEBRATING 10+ YEARS OF ACHIEVEMENT

As we were preparing project applications in November, 2009, we realized that we have a lot to celebrate.—the Chartiers Creek Watershed Association was organized about ten and a half years ago, in the spring of 1999.

Our list of projects and activities throughout those ten years is a long one. They have included development of long-range plans for Chartiers Creek and Canonsburg, as well as a variety of educational and outreach programs for schools and the general public, and cleanups along several stream segments and Canonsburg Lake.

One of the earliest projects organized was water quality monitoring at several stream sites. Monitoring continues to be an important task for the organization.

We look forward to continuing efforts to protect the Chartiers Creek watershed in the years to come.

CALENDAR

JANUARY

13— ChCWA monthly meeting, 7:00 pm

20— Wash. Co. Watershed Alliance, 7:00 pm

FEBRUARY

10 — ChCWA monthly meeting, 7:30 pm

MARCH

10 — ChCWA monthly meeting, 7:00 pm

tba — Ag Days

ChCWA regular monthly meetings:
1st Wed., 7 p.m., (7:30 pm April-Sept.)
Cooper-Hinds Building, Meadowlands.

QUESTION: HOW DO WE MANAGE STORMWATER IN DEVELOPED AREAS?

Why do streams in lightly developed or undeveloped watersheds, such as a forest campground, look and behave differently following storms than do the streams in our own developed Chartiers Creek watershed? One primary reason can be summed up in two words - LAND USE.

In the undeveloped watershed of our campground, it is likely that well over 90 % of the watershed is covered in growing vegetation and undisturbed permeable soils covered by a protective layer of leaves and other plant material, and less than 5 percent is under impervious surfaces (roads, parking lots, roofs). In a natural environment, on average, 50% of the rainfall infiltrates into the soil, 40 percent is returned to the atmosphere via evapotranspiration, and less than 10 percent becomes surface runoff. Thus, in natural environments a small **volume** of rainwater enters the stream as direct runoff AND it enters the stream at a slow **rate** because it is slowed by vegetation and leaf litter.

In developed areas, however, such as exist in many parts of the Chartiers Creek watershed, a large percentage of the watershed is covered in impervious surfaces which causes a significant increase in the percentage of stormwater that becomes surface runoff.

Table 1 shows the percentages of Evapotranspiration, Infiltration, and Surface Runoff that occurs as the percentage of impervious surface in a given area increases. You can see that there is increase in the percentage of surface runoff when as little as 20 percent of the watershed is under impervious surfaces. By the time 75% to 100% impervious surface is reached (as it is in many of our developed commercial areas), the percentage of rainfall volume converted to surface runoff increases to 55% compared to 10% under natural ground cover.

Table 1. Stormwater paths with increasing percentage impervious cover in watershed

Percent Impervious Surface	EVAPO-TRANSPIRATION (%)	INFILTRATION (%)		RUNOFF (%)
		SHALLOW	DEEP	
Natural Ground Cover	40	25	25	10
10 – 20 percent	38	21	21	20
35 – 50 percent	35	20	15	30
75 – 100 percent	30	10	5	55

U.S. EPA Green Infrastructure Website Series, Site Planning and Design Considerations, May 12, 2009
http://www.epa.gov/npdes/outreach.cfm?program_id0&otype=1

Not only does the **VOLUME** of runoff increase with the increase in developed areas, but so does the **RATE** at which it discharges to the stream because there is often nothing to slow the flow of stormwater off of impervious surfaces. And, not only does the **VOLUME** and **RATE** of runoff increase, but the **POLLUTANT** load increases. Oil and grease, antifreeze, and heavy metals, fertilizers and pesticides, and plastic and other litter are swept toward the streams with no ground vegetation or leaf litter to filter them out as in a natural environment.

The increased surface runoff volume, rate, and pollutant loads result in severe physical degradation of streams including bank erosion, sedimentation, channel downcutting and loss of connection with the floodplain, water quality degradation, destruction of aquatic habitat, loss of aquatic species, loss of aesthetics and recreational opportunities, and downstream flooding.

So, how can we manage stormwater to help protect and restore our streams to be more as they were before development, able to function more like the streams we enjoy on our camping trips?

ANSWER: With new and innovative stormwater management practices

In the upper Chartiers Creek watershed, stormwater systems are separate from the sanitary sewer system and discharge stormwater directly to the streams. The stormwater might directly enter the storm sewer system which discharges to the stream, or it first might be directed into detention basins or underground tanks before entering the storm sewer system. But, either way, it all ends up in a stream.

QUESTION: HOW DO WE MANAGE STORMWATER IN DEVELOPED AREAS? [cont.]

Many people are familiar with the heavily developed, commercial stretch of Route 19 in Peters Township between McMurray Road and Waterdam Road. Stormwater management methods on existing developed sites include direct discharge, underground tanks, oversized storm sewer pipes, and detention ponds, all of which discharge into the storm sewer system that discharges to Canonsburg Lake. These methods control rate to varying degrees, but do not control volume or, with one exception, do not improve water quality.

Donaldson's Crossroads Shopping Center discharges directly into the storm sewer system, without underground tanks or detention ponds, with no flow rate control. Some variation of underground tank systems are installed in the McDowell Shops site, the McMurray Shops, Waterdam Plaza, and Lakeside Plaza. These tanks capture water before it is discharged to Canonsburg Lake, and may or may not exert control over the rate. Waterdam Commons utilizes a vegetated detention pond, which controls runoff rate and provides some pollutant removal.

Recent revisions to the Pennsylvania Department of Environmental Protection (PADEP) stormwater regulations, NPDES permits (PAG-02 and Individual NPDES permit), and Erosion and Sediment Control Best Management Practice Manual are designed to manage stormwater rate, volume, and water quality. Many new methods and proprietary products have been developed that reduce volume to pre-construction levels or lower, manage rate, and improve water quality. Some examples: underground infiltration tanks, rain gardens, constructed wetlands, bioswales, porous pavement and permeable pavers, water quality inserts in catch basins, and "green roofs".

Carol Teodori was in the vanguard in 2002 when she asked Evolve, Inc. to design the Changing Seasons Learning Center, several years before "Low-Impact-Design" and "green" buildings entered the mainstream. Stormwater management here employs infiltration, underground storage, bioretention, and above ground storage in a landscaped pond. Parking areas were constructed with a cellular confinement system and plastic porous paving system through which the rainfall infiltrates the ground. Runoff from the roof enters underground cisterns which drain to a landscaped wetland called the "Marsh" to infiltrate through the marsh or be taken up by the plants; any overflow goes to the pond. The system is designed to send any overflow to the municipal storm sewer. However, Ms. Teodori reports that they have never seen any water leaving the site, even during and after the hurricane-caused storms in 2004.

Now under construction, Lake View Square will be completed in January, 2010. International design firm Burt Hill provided sustainable architecture, landscape architecture, and civil engineering solutions for design of the development. The design of Lake View Square incorporates water quality inserts in all stormwater inlets, sumps, and a proprietary underground infiltration facility (Rain Tank®). Each insert has a series of graduated stainless steel screens to capture various sized particles and debris while allowing water to efficiently pass through the system. Each catch basin insert is equipped with polycarbonate storm booms to further confine oil, grease, and other such unwanted water pollutants. After filtering occurs at the inlet, the stormwater continues to drain through to the infiltration facility. The inflow to the infiltration facility has a sump, or standing pool of water, that then settles out any particles not previously captured at the inlets. Once through the sump, the stormwater enters the infiltration facility, to begin to soak into the ground. The facility, made of 85% recycled polypropylene, infiltrates the increase in volume as determined by analyzing pre- and post-development runoff based on the "two-year storm" as prescribed by the PA DEP. The runoff is further cleansed by natural processes, and eventually migrates into nearby Canonsburg Lake.

The ChCWA encourages developers and site owners to use the best available technologies and innovative methods to reduce the volume and rate of stormwater and improve water quality for the protection and eventual restoration of our streams. We also encourage owners of existing developed sites to retrofit their sites with some of these methods, such as rain gardens, green roofs, and permeable pavers/porous pavement.

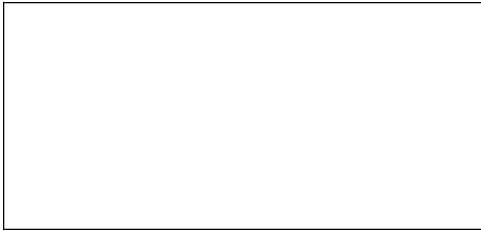
The next time you see a site under development, take the time to ask your municipal planning commission or the developer what stormwater management methods are being used. Attend planning commission meetings to find out about proposed developments, and encourage the use of volume reduction and water quality improvement methods.



100 West Beau Street, Suite 105
Washington, PA 15301



Chartiers Creek
near Houston



Contents:

- ◆ What's ahead for 2010
- ◆ Celebrating 10 Years of Achievements
- ◆ **QUESTION: HOW DO WE MANAGE STORM-WATER IN DEVELOPED AREAS?**

This newsletter has been partially funded by the League of Women Voters of Pennsylvania Citizen Education Fund under a grant from the PA Department of Environmental Protection.

ADDRESS CORRECTION?

Send to: Joan Jessen, editor
159 Canterbury Lane, McMurray, PA 15317;
or email: joanjessen159@gmail.com

Chartiers Creek Watershed Association

Purpose: to enhance, protect and develop the ecosystem of the upper Chartiers Creek Watershed in Washington County, PA

Membership: open to anyone who lives in the watershed, as well as individuals, businesses and organizations that own property or are actively involved within the boundaries of the watershed.

Please join us! Annual Dues: Individual, \$10; Family, \$15; Organization, \$50

MAIL THIS FORM WITH YOUR CHECK TO:
Chartiers Creek Watershed Association
Joan Jessen, treasurer
159 Canterbury Lane, McMurray, PA 15317

Name: _____

Address: _____

Tel.: _____ Email: _____