East Cocalico Township
Stormwater FAQs
(Frequently Asked Questions)

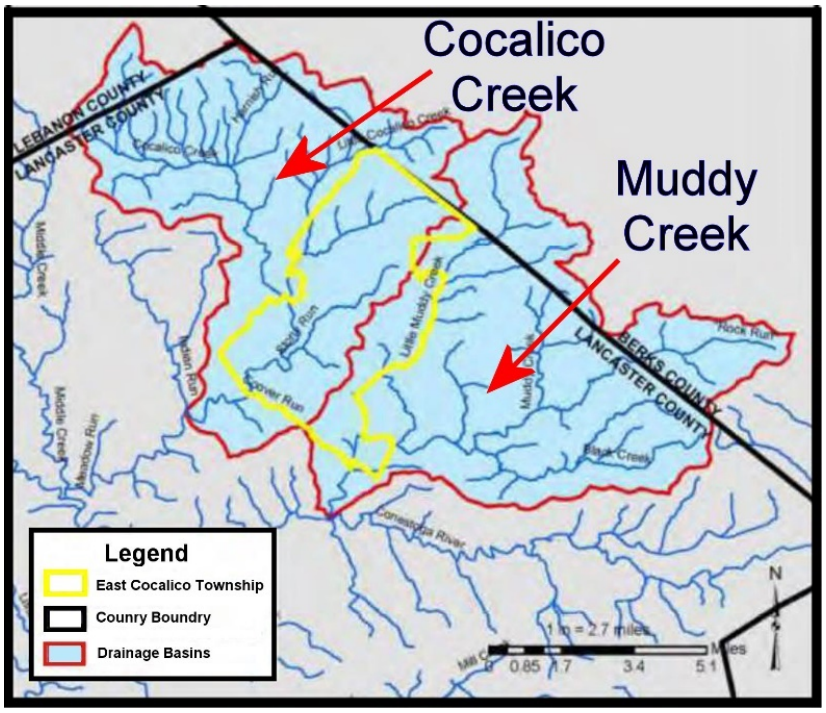
High flow in streams creates erosion resulting in sediment being carried downstream as seen by the “chocolate milk” appearance of this stream.

What is stormwater?

Stormwater is water that runs off both natural land surfaces and man-made surfaces rather than soaking into the ground. It can come from rainfall, or melting snow and ice. Most stormwater enters streams, but some can evaporate or infiltrate into the ground.

Where does stormwater go?

The simple answer is that water flows downhill. In East Cocalico Township there are two main drainage areas, Cocalico Creek and Muddy Creek. Both of those streams flow into the Conestoga River, which flows into the Susquehanna River. The Susquehanna River forms a large part of the Chesapeake Bay Drainage Area. Here is a map of the two main drainage areas in the Township:



The two major drainage basins in East Cocalico Township.

Why has stormwater become such a big deal?

With increasing development, there is more stormwater entering our streams, and also more pollution going into those streams. This pollution has had a large negative impact on the Chesapeake Bay. The Bay is in danger of losing many economically important aquatic species (such as fish and crabs) and also recreational opportunities could be limited resulting in a decrease in tourism and the income associated with it.

Why do we have to clean up our stormwater?

The only practical way to clean up the Chesapeake Bay is to improve the quality of the water entering the Bay. To improve the water quality in our streams requires preventing pollutants from entering them. Improving the quality of stormwater requires a variety of approaches, including engineered structures such as stormwater detention basins designed to treat water quality and reduce the rate of flow of water leaving the basins (faster flowing water washes more soil into streams from erosion). It also requires human behavior to change, such as using less fertilizer and

pesticides on our lawns, and for farmers to use methods to reduce stream pollution from agriculture.

What pollutants are in stormwater?

Almost any substance can get into streams. But in the case of the Chesapeake Bay, the pollutants of greatest concern include nitrogen and phosphorous (both act as a fertilizer resulting in excess algal growth, which in turn reduces the light levels reaching beneficial aquatic plants (which feed aquatic organisms and drives the entire food chain in the Bay) sediment, and bacteria. Sediment is fine soil particles suspended in the water which tends to give it a brown color similar to chocolate milk. It also blocks light from reaching plants, and also interferes with breathing through gills in crabs, fish and many other important species in the Bay. Bacteria can make the water dangerous for recreational use.

How do pollutants get into stormwater?

As water runs over land surfaces it picks up fine particles of soil (sediment), bacteria, and dissolves chemicals and nutrients (such as nitrogen and phosphorous) from various sources such as animal waste, and excess fertilizer applied to lawns and farms. Those pollutants contaminate the streams, degrading their water quality.

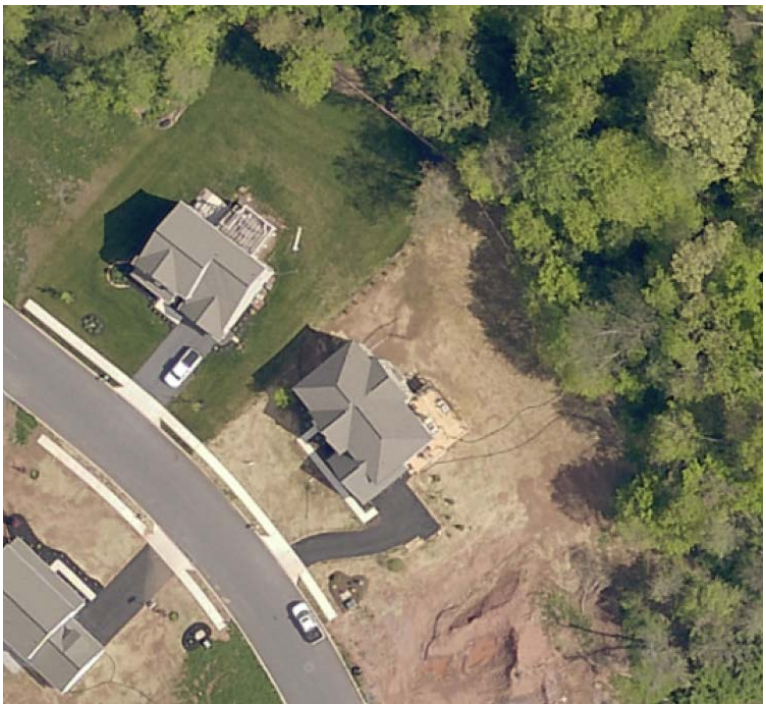
What is erosion?

Erosion is when fast moving water picks up soil and other particles and carries them away. Erosion removes soil from stream banks in areas where the water is fast moving. This damages the stream banks, and can cause trees to topple into the streams, and endanger structures near the stream such as bridges. It also adds sediment to the water that will be deposited somewhere downstream.

Stream bank erosion from high flow rates in a stream.

How does land development affect stormwater?

When land is changed from natural vegetation (where much of the stormwater can soak into the ground) to rooftops, roads, driveways, sidewalks, and other man-made structures, much less water soaks into the ground and more of it runs off. Without stormwater management facilities (such as basins) the additional runoff would carry more pollution into the streams, and also the increased rate of flow in our streams results in more stream bank erosion and potentially increases flooding.



Development creates more impervious surfaces by replacing natural vegetation with solid surfaces, creating the need for stormwater control measures.

What is an impervious surface and how does it affect stormwater?

Natural vegetated areas allow much of the rainwater to soak into the ground. When we add impervious surfaces (where water runs off instead of infiltrating into the ground) it increases the amount of water running off land surfaces. This washes more pollutants into the streams and causes more erosion of soil from the stream banks.

How can stormwater quality be improved?

The first step to reduce the amount of pollutants in stormwater is to decrease the rate of flow from a property. Faster moving water has more force to erode soils and other pollutants. Also, how fast water is moving determines how much sediment the water will carry. Slowing the water's flow rate will cause sediment to settle out of the water. A storm water detention basin catches stormwater and releases it slowly. This reduces the erosion caused in streams, and also allows part of the sediment to

settle out in the basin rather than be carried into a stream. In areas with a lot of sediment in the stormwater may require basins to be cleaned out more frequently.

Other strategies for improving stormwater quality is to reduce the amount of runoff. Use of less area of impervious surfaces (paving, rooftops, etc.) will allow more of the water to soak into the ground. Use of "pervious" paving which allows water to pass through it into the ground can also help. Narrower streets can also reduce impervious surface area. These strategies are all part of the design process for new construction.

On existing development, removal of unnecessary impervious surfaces can help. Unnecessary paving or structures can be removed to decrease runoff. Planting of vegetation will also decrease runoff and slow the remaining runoff. This also improves stormwater quality.

Who is responsible for cleaning up stormwater?

The primary person or organization responsible for cleaning up stormwater is the property owner. Municipalities, such as East Cocalico Township, are also responsible for keeping stormwater clean. Both the Federal Government (through the Environmental Protection Agency) and the Commonwealth of Pennsylvania (through the Department of Environmental Protection) require municipalities to reduce the levels of pollution in streams within their boundaries. The municipalities enforce this through local ordinances regulating development and existing developed land.

What can property owners do to help keep the stormwater flowing off their property clean?

Knowing which activities contribute to polluted runoff is the first step. Typical activities that might occur on a residential property include lawn mowing, car washing, gardening, or any other activity that disturbs the soil such as gardening or landscaping or lawn fertilization. When it rains, disturbed soil or excess fertilizer will contaminate the runoff. If car washing is done on an impervious surface, the soapy, dirty water will also run off

into storm drains or into streams. Grass clippings can also be carried off by runoff.

To prevent these activities from contaminating stormwater, some simple approaches can go a long way.

- First, if you fertilize your lawn yourself, consider having your soil tested to determine exactly how much fertilizer is really needed. Soil can be tested with a home test kit, or a sample can be sent to Penn State Extension, where a test costs only $9.00. This step can also save you money by cutting the amount of fertilizer needed, saving on the purchase cost as fertilizer has become expensive. Having a professional service do the fertilizing can also help if the company is using ecologically based methods to determine application rates.
- Washing your car at a car wash helps protect the environment. Those facilities recycle and filter the water so that contaminated water is not discharged to storm sewers. Washing your car where the water can soak into a grassy area also keeps the contaminated water from getting into streams.
- Be sure that grass clippings don't get onto sidewalks or pavement where they can wash off. Using a good mulching mower cuts the clippings into small fragments that fall between the grass blades and won't be carried off by rain. Also collecting the clippings and disposing of them properly will help, but in this case you lose the nutrients contained in the clippings possibly requiring more fertilization to replace the lost nutrients.
- Any project that disturbs soil, such as gardening or landscaping can create areas of soil without plant cover. Plant roots hold the soil in place so it can't run off in stormwater. Mulching will also limit the amount of soil lost when it rains.
- Finally, never dump **ANYTHING** into a storm drain since it will eventually end up in a stream. Storm drains are **ONLY** for rainwater.

Links to additional pollution prevention strategies for property owners are found at the bottom of our main stormwater page.

Is it expensive to clean up stormwater?

Unfortunately, yes. Designing and installing engineered stormwater structures can be very costly and take up valuable land areas. However, many "good housekeeping" procedures can help a lot without significant cost. The main goal is to stop the polluted from entering our streams.

How can erosion be reduced?

There are a variety of ways in which erosion can be reduced. Because fast flowing water moving over soil (especially disturbed soil) is what causes erosion, anything that reduces the flow of water or protects the soil for coming into contact with the moving water will limit erosion. One way to reduce erosion on disturbed soil is to cover the soil with mulch. This will help unless there is sufficient flow to carry the mulch away, in which case the mulch could also become a pollutant. This method also helps in gardens landscaping on residential properties.

Installation of silt fencing is used on construction site with soil disturbance. It is made from a tough fabric that allows water to slowly pass through the fence. The lower edge of the fabric is buried in the ground. By slowing down the water and also filtering out the larger it does a good job of reducing the amount of sediment in the water.

Silt fencing, if properly installed, can reduce sediment runoff from construction sites or other disturbed areas lacking vegetation.

A newer technology for reducing sediment in runoff is "silt sock." It consists of a tube of biodegradable porous fabric that is filled with mulch or a similar material. It is staked down to the ground so that water can't pass

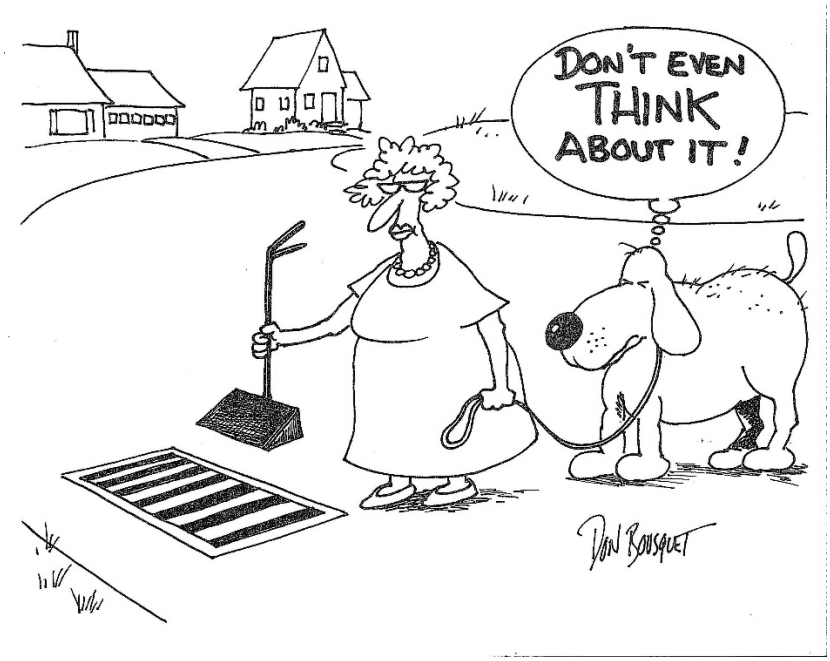
under it. It acts in a manner similar to a silt fence, but can be effective in filtering the runoff.

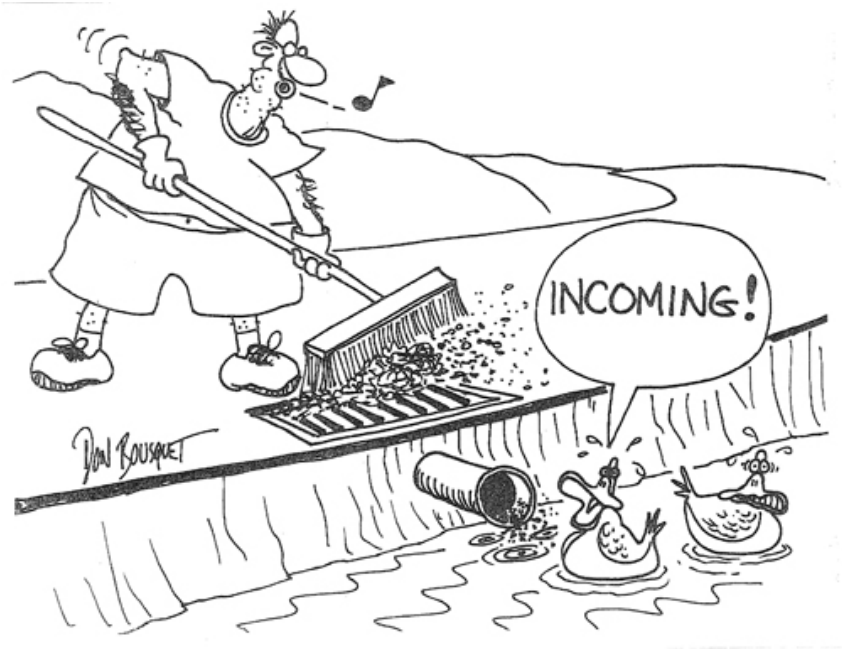
"Silt sock" made from a porous fabric tube filled with mulch filters stormwater running off construction sites to help keep sediment out of streams and wetlands.

What is an illicit discharge?

An illicit discharge is any polluting substance dumped into a stream or other water body or into a storm drain. In Pennsylvania, this is illegal and can result in very significant fines, especially if a fish-kill results from the discharge.

If you see an illicit discharge happening, or see that one has occurred, please report it immediately by calling 911 and/or reporting it to the PA Fish and Boat Commission's hotline at 855-FISH- KIL at 855-347-4445 or the Pennsylvania Department of Environmental Protection at 1-800- 541-2050 (24 hours a day, 7 days a week).





Cartoons courtesy of [RIstormwatersolutons.org]

Return to East Cocalico Stormwater Page