Northwestern Pennsylvania Homeowner's Guide to Stormwater Management

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This guide is intended to help property owners living in Northwestern Pennsylvania evaluate current runoff pathways and identify practices to better manage stormwater runoff on their properties. This guide includes several practices to choose from that are fairly simple to plan and construct.

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Section 1: What is Stormwater Runoff and Why is it a Concern?

Stormwater runoff is precipitation (rain or snowmelt) that flows over the land surface. It is created when precipitation falls on roads, driveways, parking lots, rooftops and other paved surfaces that do not allow water to soak into the ground. Rain that becomes runoff carries soil, pollutants, and other materials from the land swiftly into storm drains or streams that ultimately flow to Lake Erie or the Ohio River. Where rain falls on paved surfaces, a much greater amount of runoff is generated compared to runoff from the same storm falling over a forested area, where most of the water is absorbed by trees or soaks into the soil.

The Negative Impacts of Stormwater Runoff

Poorly managed stormwater runoff can cause many problems. These include:

- **Flooding:** When rain falls on hard surfaces, such as rooftops, parking lots, and roads, large volumes of stormwater runoff are created and quickly reach streams, causing them to rise and flood. As more hard surfaces are added to an area, the frequency and severity of flooding increases, threatening infrastructure, property, and people.
- **Pollution:** Stormwater runoff also picks up and carries with it many different pollutants that are found on paved surfaces such as sediment, nutrients, bacteria, oil and grease, trash, pesticides and metals. These pollutants come from a variety of sources, including pet waste, lawn fertilization, and illegal dumping and spills, and flow untreated into local streams, polluting our waters.



- **Erosion:** The unnaturally high volume and speed of stormwater runoff can cause severe stream bank erosion when it enters the stream channel. Ongoing bank erosion can eat away at streamside property and infrastructure, and damages natural habitat for fish and other aquatic life. This erosion is another source of sediment pollution in streams.
- Threats to Human Health: Polluted runoff is the leading known cause of high bacteria levels triggering beach closings, swimming advisories, and bans or restrictions on shellfish harvesting. Stormwater runoff can also carry toxic pollutants and viruses. Excessive stormwater runoff can overwhelm sewage treatment plants in combined sewer areas, causing discharges of these pollutants directly into waterways. These pollutants can contaminate drinking water supplies and hamper recreational opportunities, as well as harm fish and other aquatic life.



Regulations Created to Address the Negative Impacts of Stormwater Runoff

To combat ineffective stormwater management, especially after Hurricane Agnes, PA Act 167 was put into effect on October 4, 1978. Act 167 was created specifically to address "inadequate management of accelerated runoff of storm water resulting from development throughout a watershed." The Act requires that counties must create and submit a detailed stormwater plan to the Pennsylvania Department of Environmental Protection that discusses how runoff will be addressed. This process requires that ordinances and regulations are created, and that they must be adopted by all municipalities within the county.



Homeowner Stormwater Management Requirements in Lawrence County

<<NOTE: REPLACE WITH COUNTY SPECIFIC INFO HERE>>

For all additions of new impervious area within Lawrence County, the following requirements contained in the Regulated Activities Table below apply. For details regarding the Small Project Stormwater Management (SWM) Application, Volume Control, and Peak Rate Control, please see the local municipal Stormwater Management Ordinance.

Amount of New Impervious Area (Square Feet or SF)	Stormwater Management Application Requirements		
0 SF ≤ new impervious area < 1000 SF	Required: Exempt from additional requirements		
1000 SF \leq new impervious area < 2500 SF	Required: Small Project SWM Application ¹ (See Appendix F)		
2500 SF ≤ new impervious area < 5000 SF	Required: Volume Control (Section 304) and Small Project SWM Application (See Appendix F)		
5000 SF ≤ new impervious area	Required: Peak Rate Control (Section 305), Volume Control (Section 304), and Stormwater Management Site Plan		

¹ The municipality can require the applicant to provide supplemental and additional information beyond the Small Project SWM Application if there is a threat to property, health or safety

Note that all Regulated Activities must comply with the State Water Quality Requirements.

For further information regarding stormwater management requirements near you please contact: **<<NOTE: INSERT COUNTY SPECIFIC CONTACT INFO HERE>>**

Section 2: Evaluating Stormwater Runoff on Your Property

It is important to fully assess the opportunities and challenges on your property when selecting the most appropriate stormwater management practices. Some practices may not be feasible, and others may not be practical. Some may even be potentially dangerous or otherwise problematic. Following these steps will help eliminate some guesswork, ensure functional and effective practices are selected, and provide the greatest chance of long-term success. This is intended to be a quick reference tool.

Step 1 – Create an Existing Condition or Base Map

Start with an aerial photo from an online mapping tool like Google Maps, or perhaps a plat if one is available. The figure on Page 7 shows the site constraints that may affect the choice of practice and location. First, map the following on your plat or aerial photo:

- Outline property boundaries
- Highlight the impervious surfaces such as roofs, decks, sheds, pools, driveways, and sidewalks
- Mark locations of trees and landscaped areas
- Measure and calculate the areas of impervious surfaces for use in calculating size of practices

Step 2 – Map Flow Paths

Mark on the map the flow paths of runoff around the site. It is often easier to intercept water where it naturally flows, rather than divert it elsewhere.

Step 3 – Map Utilities and Easements

Resources such as Pennsylvania One Call may help identify the location of underground utilities such as electric, gas, sewer, water, cable and telecommunications lines, which must be avoided when digging. Always call Pennsylvania One Call (dial 811 or 1-800-242-1776) before digging!

Step 4 – Map Problem Locations and Areas of Interest

Erosion, poor grass cover, invasive plants, steep slopes, rocky areas, areas planned for some future use, and environmentally sensitive areas such as stream buffers and forest conservation areas are all considerations relating to location and feasibility of stormwater management practices. Soils also play a big role in determining which practices are feasible.

Step 5 – Create Proposed Conditions Map

Mark the locations available for projects. The available space may partially determine which practices are feasible; undersized practices may not withstand storms or provide any benefit, and oversized practices may not get enough water to sustain the plants that are part of the practice. Use the local municipal regulations to determine the ideal size of the practices being considered.



Section 3: Creating an Effective Stormwater Plan for Your Property

Tools for the Job - Stormwater Management Practices

There are several different tools available to effectively treat stormwater management from your property. Each practice has sizing and siting constraints. The table below shows which practices are ✓ and are not × appropriate for specific locations. It also lists special needs for certain practices to work on those locations. Four of the most common and easier to install stormwater management practices are introduced below:

Location	Rain Gardens	Infiltration Trenches and Dry Wells	Permeable Hardscapes	Vegetated Channels	Notes
Next to building	2,3	×	×	√ 2,3	 Refer to chapter for guidelines, section "Location and Feasibility". Stormwater planters or ultra-urban bioretention are also options. Direct overflow at least ft. from foundation. Locate underground tanks at least 10 ft. from foundation.
Next to drinking water well	×	×	×	×	 Direct overflow at least 25 ft. from well.
Next to septic drain field	×	×	×	×	1. Do not site directly on drain field due to potential compression.
Under tree canopy	×	×	×	×	1. Plant selections should match sunlight conditions.
Sandy soils	\checkmark	✓	✓	 ✓ 	

Location	Rain Gardens	Infiltration Trenches and Dry Wells	Permeable Hardscapes	Vegetated Channels	Notes
Clay soils	√ 1	×	√ 1	√ 1	 Soil amendment or localized replacement may be necessary. See Soil Assessment for more detail.
Top of slope	× 1	× 1	✓ 2	√ 3	 Locate where they can accept more runoff. Permeable Hardscapes can be at the bottom of a slope, but care should be taken in sizing to not overload the practice. Vegetated channels should only be used for slopes between 1% and 6%.
Bottom of slope	~	\checkmark	√ 1	√ 1	 It is important not to send too much water to these practices.
Near/over utility lines	X 2	X 2	X 2	X 2	 Allowable proximity to utility lines should be confirmed by utility company or municipal government. Under certain special circumstances, it may be possible to locate these over underground utilities, with careful coordination with the utility companies. Underground tanks have the same considerations as below- ground practices. (See note 2)

Rain Gardens

What is it?

Rain Gardens are shallow landscaped depressions that receive stormwater runoff from surrounding areas, and hold and naturally treat that runoff. They are very similar to Conservation Landscapes, except that they are lower than the surrounding ground – therefore they collect and treat more runoff. The plants used in Rain Gardens need to be able to tolerate occasional inundation as well as dry conditions between rain storms.

Do:

- Conduct a full site assessment to choose best spot for Rain Garden
- Place Rain Garden in a low spot and direct runoff to Rain Garden
- Consider "treatment train" options, such as catching roof runoff in Rain Barrels and draining those into the Rain Garden
- Call Pennsylvania One Call before digging
- Use appropriate soil mix, depending on existing soil characteristics
- Water plants during the first growing season, especially during dry conditions
- Inspect finished Rain Garden after several storms

Don't:

- Place Rain Garden in a soggy area (poorly drained soil) that already stays wet for many days after rain
- Place Rain Garden within 10 feet of building foundation
- Place Rain Garden under tree canopy, above utilities or septic fields, or next to wells
- Compact the soil under the Rain Garden during excavation

A homeowner with experience in landscaping can undertake a simple Rain Garden project. Consult a landscape contractor or design profession for moderate to complex projects, or when the project requirements are uncertain.