INTRODUCTION TO STORMWATER

INTRODUCTION

Precipitation from rain or snow melt that doesn't soak into the ground and flows over the surface into a waterbody or waterway is stormwater, and is part of the hydrologic cycle. Stormwater is everywhere, from rural, agricultural, and urban land. Stormwater will pick up and carry pollutants it encounters into the waterway such as oil and grease, road salt, sediment, nutrients, pathogens, and more.

Stormwater management refers to the control of this runoff from precipitation events. In a natural, undeveloped landscape, the water will infiltrate into the soil and recharge groundwater (an important source of drinking water for those with wells and the source of critical baseflow in streams and rivers during periods of drought), absorb into vegetation to evaporate and transpire into the atmosphere, and when the soil cannot absorb any more, it will runoff into surface waterways.

When construction and development occur, the amount of impervious cover increases. Impervious surfaces are non-porous and include roads, parking lots, buildings, and any other surfaces which prohibits rainwater from seeping into the soil. Additionally, natural surfaces such as lawn and tilled agricultural land can become compacted over time and act similarly to impervious cover.

Impervious areas act as a barrier to the naturally-filtering soil, which decreases the amount of rain that can infiltrate, therefore the fraction of surface runoff increases. An increase in surface runoff volume and flow rate contributes to soil and streambank erosion, flooding, reduced groundwater flow, and lower water quality. This increased amount of runoff contributes to more surface pollutants being transported and discharged into groundwater and waterways.

Flooding post storm

APPLICABILITY

Stormwater management can support the following goals:

1. **Conservation**: Stormwater management will reduce the volume and rate of stormwater runoff, which in turn reduces soil and streambank erosion to protect waterways, drinking water, and wildlife habitat.
2. **Water Quality**: Water Quality will improve with the reduction of erosion, sedimentation, and other pollutants running off into waterways. Best Management Practices (BMPs) can increase infiltration and encourage pollutant removal prior to recharging groundwater.
3. **Climate Resiliency and Sustainability**: Stormwater management is a tool for hazard mitigation and will reduce a community's vulnerability to extreme rainfall and flooding events. BMPs will reduce runoff rates and volume, reduce the flooding of waterways and infrastructure.

IMPLEMENTATION

There are local, state, and federal regulations and requirements regarding stormwater for both Municipalities as well as private developers to comply with that help to manage stormwater volume and velocity, and maintain clean waters. Zoning ordinances can constrain impervious surface development on parcels, and Subdivision and Land Development or Stormwater Ordinances can encourage GSI to be utilized for stormwater management.

To manage stormwater in a municipality, Best Management Practices (BMPs) should be implemented in both urban and agricultural landscapes. These BMPs act to collect, slow down, filter, or infiltrate rainwater runoff. Taking a holistic approach to manage stormwater with partners up and downstream can make watershed-wide improvements.

Stormwater management includes identifying problem areas, planning on a local and watershed-level, implementing BMPs and complying with local ordinances. Often, part of the implementation process for stormwater management is the municipality securing funds to complete each of these phases.

Rain garden installed on East Marlborough Township Buildings campus

Landscaped Cul-de-sac in Eagle Hunt development

SUCCESSFUL CASE STUDIES

Chester County:

- Chester County Act 167 Stormwater Management Model Ordinance (2022)
  - East Bradford Township (2022)
  - London Grove Township (2022)
  - West Goshen Township (2022)
  - Honey Brook Township and Honey Brook Borough Intergovernmental Agreement for Administering MS4 Permit Requirements (2025).

Delaware County:

- Delaware County Act 167 Stormwater Management Model Ordinance (2022)

For more information on Stormwater BMPs, see the Brandywine Conservancy Toolkit on Green Stormwater Infrastructure and the Guide to Green Stormwater Infrastructure.

For more information on Municipal Stormwater resources and tools, see the Brandywine Conservancy Toolkit on Municipal Stormwater Management.

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