2023-2024 MS4/Stormwater Training

Marietta Borough

Prepared December 2023

Presentation Outline

- Background
- Marietta Borough's Stormwater Permit and Program
- Minimum Control Measures (MCMs)
  - Public Education
  - Public Involvement
  - Illicit Discharge Detection and Elimination
  - Construction Stormwater Management
  - Post-Construction Stormwater Management
  - Good Housekeeping Procedures

Purpose of Stormwater/MS4 Training

Fulfill	Educate	Enable	Prepare	Provide
Fulfill the requirements of Marietta Borough's small municipal separate storm sewer system (MS4s) general permit.	Educate staff on specifications of permit requirements related to employee activities.	Enable staff to carry out daily functions while simultaneously protecting our waterways.	Prepare staff to effectively and efficiently respond to incidents that could potentially harm our environment, including but not limited to waterways.	Provide staff a forum to contribute thoughts and/or questions related to stormwater management.

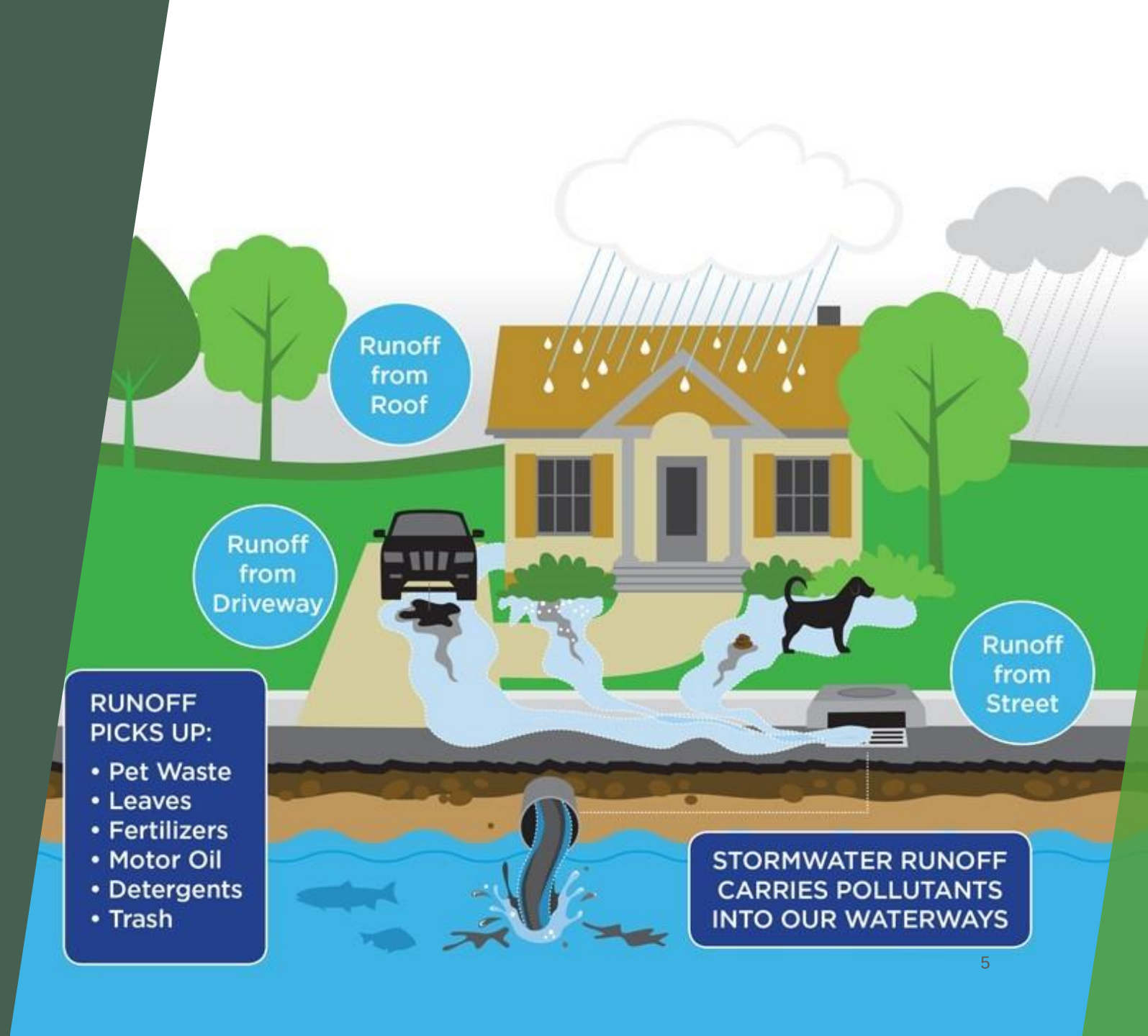
What is Stormwater?

- Stormwater is rainwater or snow melt that runs off streets, lawns and other sites. When stormwater infiltrates into the soil, it is filtered and ultimately replenishes aquifers or flows into streams and rivers.
- In developed areas, impervious surfaces such as pavement and roofs prevent precipitation from naturally absorbing into the ground. Instead, water runs rapidly into storm drains, sewer systems and drainage ditches and can cause:
  - Downstream flooding
  - Stream bank erosion
  - Increased turbidity (muddiness created by stirred up sediment) from erosion
  - Habitat destruction
  - Combined storm and sanitary sewer system overflows
  - Infrastructure damage
  - Contaminated streams, rivers and coastal water
- The system of storm drains, sewer systems and drainage ditches makes up the Borough's Municipal Separate Storm Sewer System (MS4).

Source: https://www.epa.gov/greeningepa/epa-facility-stormwater-management

Typical Stormwater Pollutants

- Liquids from uncovered dumpsters
  - Printing inks, food, etc.
- Fecal Bacteria
  - Pet waste, human waste from sewer breaks
- Petroleum
  - Oil, grease, leaking vehicles
- Cooking greases/oils (homes, restaurants)
- Sediment (soil)
- Trash/garbage
- Engine coolants/antifreeze (glycols)
- Heavy metals from vehicle break parts and tires
- Fertilizers and pesticides (residential, industrial, agriculture uses)
- Detergents from outdoor car washing, mop wash water dumped outdoors, etc.



Stormwater Exceptions

- Except where specifically prohibited under the “Discharges Not Authorized by this General Permit” section, the Borough’s General Permit authorizes the discharge of stormwater to surface waters from regulated small MS4s. In addition, the following non-stormwater discharges are authorized by the permit so long as the discharge does not cause or contribute to pollution as defined in Pennsylvania’s Clean Streams Law:
  - Discharges or flows from firefighting activities.
  - Discharges from potable water sources including water line flushing and fire hydrant flushing, if such discharges do not contain detectable concentrations of Total Residual Chlorine (TRC).
  - Non-contaminated irrigation water, water from lawn maintenance, landscape drainage and flows from riparian habitats and wetlands.
  - Diverted stream flows and springs.
  - Non-contaminated pumped ground water and water from foundation and footing drains and crawl space pumps.
  - Non-contaminated HVAC condensation and water from geothermal systems.
  - Residential (i.e., not commercial) vehicle wash water where cleaning agents are not utilized.
  - Non-contaminated hydrostatic test water discharges, if such discharges do not contain detectable concentrations of TRC.

Marietta Borough's MS4 Permit

- The Borough's MS4 permit was set to expire on **March 15, 2023**. DEP has administratively extended the MS4 general permit until the new permit can be released for public comment and review.
- At this time, the Borough is not required to submit a permit renewal application to DEP in order to continue coverage under the state's general MS4 permit. The Borough shall continue to perform MCM 1-6 responsibilities as outlined in the 2018-2023 MS4 general permit until the new permit is issued.
- Under the Borough's 2018-2023 MS4 permit, the Borough was required to reduce 16,665.90 lbs./yr. of sediment in local waterways by **July 31, 2023**. The Borough has met this requirement through the restoration of an unnamed tributary of the Susquehanna River along the Borough's northern boundary with East Donegal Township.

Maintenance of Pollutant Reduction Plan (PRP) Best Management Practices (BMPs)

- The Borough restored an unnamed tributary of the Susquehanna River during the 2018-2023 MS4 permit term in order to fulfill PRP requirements.
- This BMP shall be inspected, at minimum, annually and after large storm events to look for erosion, sediment deposition, overgrown or dying vegetation, and invasive species among other potential issues.

Characteristics of Invasive Plants

- Are habitat generalists
- Tolerate environmental extremes (e.g., drought, saturated soils, and fire)
- Lack herbivores and pathogens that serve to check their growth
- Reach reproductive age early
- Produce abundant long-lived and viable seeds
- Spread vegetatively by plant fragments, rhizomes, stolons, or tubers
- Provide little food value for native birds and other wildlife
- Have longer photosynthetic periods (e.g., leaf out ahead of natives, lose leaves later in autumn, or maintain foliage through winter)
- Grow well in disturbed areas

Source: Swearing, J.M. and J.P. Fulton. 2022. Plant Invaders of Mid-Atlantic Natural Areas, Field Guide. Passiflora Press. 200 pp.

Ecological Impacts of Invasive Plants

- Form monocultures that displace native plants and alter plant communities
- Shade out native plants through dense vertical growth, or by growing over and on top of plants
- Replace native plants with non-native species that do not support native insects, which are essential food for birds and other wildlife
- Inhibit native plants through allelopathy (i.e., release of chemicals that interfere with plant growth)
- Suppress mycorrhizae, the beneficial soil fungi that help native plants take up water and minerals
- Hybridize with native plants, diluting and altering their qualities
- Kill native trees and shrubs by girdling (i.e., blocking the movement of water and nutrients through vascular tissue)
- Alter soil functions, nitrification, and pH, making conditions less favorable for native species

Source: Swearing, J.M. and J.P. Fulton. 2022. Plant Invaders of Mid-Atlantic Natural Areas, Field Guide. Passiflora Press. 200 pp.

Control Methods for Invasive Plants

To effectively manage an invasive species, you need to identify it, understand its biology and habits, investigate the range of control options available, and select the most appropriate method for the particular situation. This approach is referred to as **Integrated Pest Management (IPM).**

Biological control is the use of living organisms, most commonly insects and pathogens, to kill or impede the spread of targeted pest plants. Prior to releasing an approved biocontrol, you will need to contact the USDA to determine whether permits are required.

Chemical control involves the use of *herbicides* – pesticides that kill plants. Always read the pesticide label and follow all requirements and recommendations to prevent harm to the environment, yourself, and others. *Pesticide certification training, testing, and licensing are provided through state departments of agiculture.*

Contact Herbicides: These products kill or damage above-ground plant parts and typically target annual plants and seedlings. These products may burn skin and eyes, have negative effects on soil microorganisms, and alter soil acidity.

Systemic Herbicides: These products are absorbed by the plant and translocated to the roots by the phloem tissue, killing the entire plant.

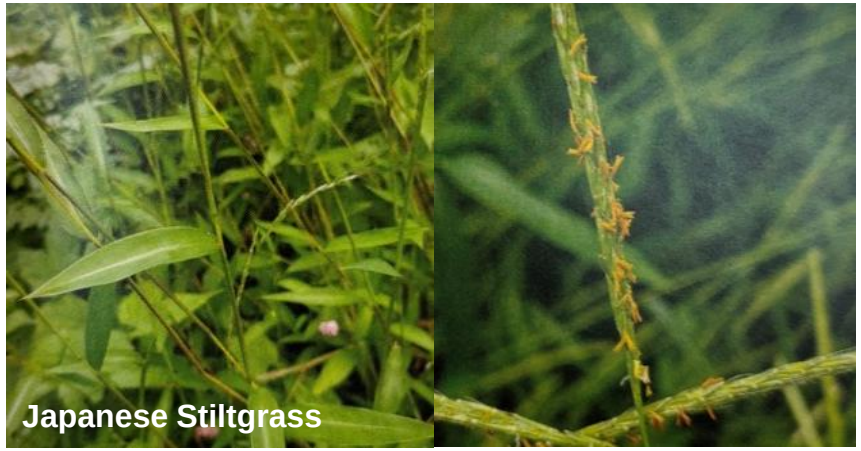
Cultural practices reduce or prevent the establishment, spread, reproduction, and survival of invasive plants by manipulating the environmental conditions. Examples include planting native species to compete with invasives; smothering invasives with thick layers of biodegradable mulch, fabric, and other materials; and employing solarization (i.e., magnifying the heat of the sun) to weaken or kill invasive plants and propagules in upper soil layers.

Manual control includes hand-pulling and use of pruning snips, hand saws, shovels, weed wrenches, and other non-powered tools. Goats and other grazing animals are also employed for manual control of invasive plants.

Mechanical control includes the use of powered equipment such as chainsaws, weed whackers, mowers, and bush hogs.

Source: Swearing, J.M. and J.P. Fulton. 2022. Plant Invaders of Mid-Atlantic Natural Areas, Field Guide. Passiflora Press. 200 pp.

Common Invasive Grasses of Mid-Atlantic Natural Areas


Japanese Stiltgrass


Bamboo


Wavyleaf Basketgrass


Chinese Silver Grass

Source: Swearing, J.M. and J.P. Fulton. 2022. Plant Invaders of Mid-Atlantic Natural Areas, Field Guide. Passiflora Press. 200 pp.

Common Invasive Forbs of Mid-Atlantic Natural Areas


Garlic Mustard


Ground Ivy


Orange Daylily


Fig Buttercup


Mock Strawberry


Canada Thistle

Source: Swearing, J.M. and J.P. Fulton. 2022. Plant Invaders of Mid-Atlantic Natural Areas, Field Guide. Passiflora Press. 200 pp.

Common Invasive Shrubs of Mid-Atlantic Natural Areas


Honeysuckle


Wineberry


Japanese Barberry

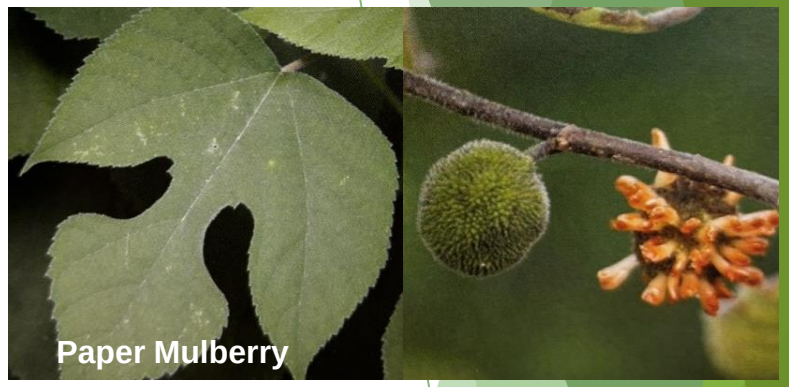

Japanese Meadowsweet

Source: Swearing, J.M. and J.P. Fulton. 2022. Plant Invaders of Mid-Atlantic Natural Areas, Field Guide. Passiflora Press. 200 pp.

Common Invasive Trees of Mid-Atlantic Natural Areas


Princess Tree


Norway Maple


Paper Mulberry


Callery Pear


Tree-of-Heaven


White Mulberry

Source: Swearing, J.M. and J.P. Fulton. 2022. Plant Invaders of Mid-Atlantic Natural Areas, Field Guide. Passiflora Press. 200 pp.

Common Invasive Vines of Mid-Atlantic Natural Areas


Asian Bittersweet


Mile-a-Minute


Sweet Autumn Clematis


Wintercreeper


English Ivy


Asian Wisterias

Source: Swearing, J.M. and J.P. Fulton. 2022. Plant Invaders of Mid-Atlantic Natural Areas, Field Guide. Passiflora Press. 200 pp.

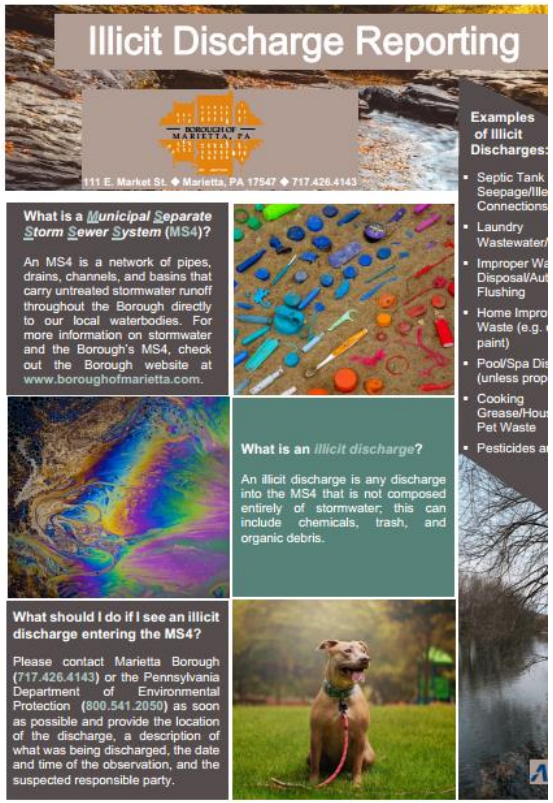
Prevent Spread of Invasive Plants

- Inspect soil around transplanted plants for unwelcome invasive hitch-hikers.
- Clean shoes, boots, and clothing of mud and seeds when moving from infested to non-infested areas.
- Never purchase, transplant, or share invasive plants.
- Never dump unwanted aquatic plants into flowing water or still water connected to flowing water.
- Choose heat-treated mulch, sterilized soil, and certified weed-free hay when purchasing landscape materials.
- Choose plants that are locally native and from reputable growers; avoid mass-produced “native” plants of unknown origin.

Source: Swearing, J.M. and J.P. Fulton. 2022. Plant Invaders of Mid-Atlantic Natural Areas, Field Guide. Passiflora Press. 200 pp.

Minimum Control Measures (MCMs)

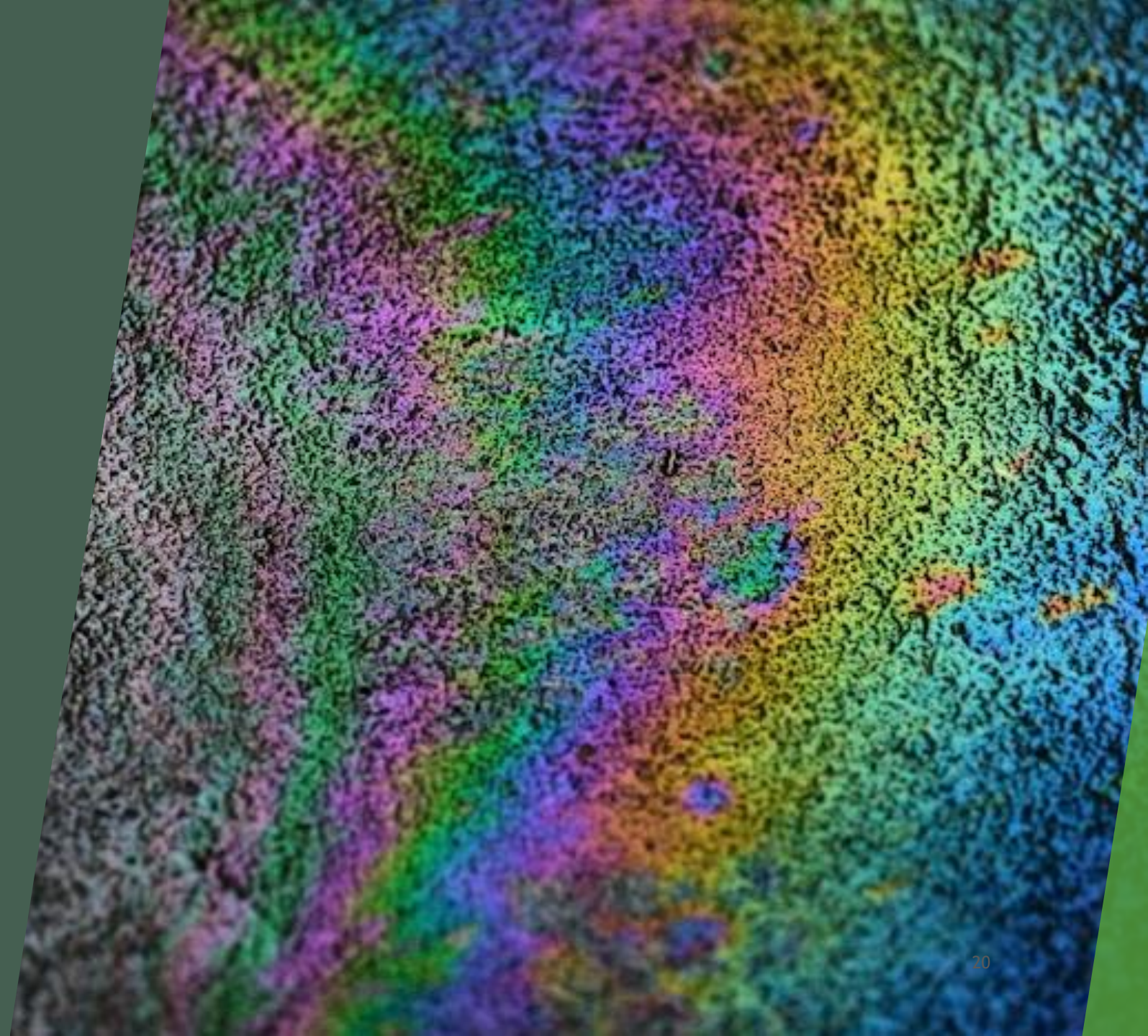
MCM 1 & 2: Public Education and Outreach



- The Borough annually creates handouts specific to the municipal stormwater program and posts them on the stormwater webpage. Printed copies are also available through the Borough office.
- The Borough must involve the public in events that promote active participation and further the education of Marietta Borough's stormwater program. Information on upcoming stormwater events is discussed during public meeting and on the Borough webpage. Qualifying events include:
  - Public Surveys
  - Storm Drain Stenciling
  - Rain Barrel Workshops
  - Social Media Driven Events
  - Stream Cleanups
  - Tree Plantings
  - Earth Day Events

MCM 3: Illicit Discharge Detection and Elimination

- An *illicit discharge* is defined as “any discharge to the MS4 that is not composed entirely of stormwater.”
  - Common illicit discharges include but are not limited to, chemicals, paints, trash, animal waste, yard debris, wastewaters, and illicit system connections.
- The Borough performs dry weather screening as a field test method for inspecting stormwater drainage areas to help locate and identify illicit discharges to a municipal stormwater system. Field testing or screening is designed primarily for assessing flowing discharges from a stormwater conveyance system.
- Anyone performing dry weather screens must be properly trained in the **(I) Site Procedures, (II) Monitoring Procedures and (III) Illicit Discharge Elimination Procedures** outlined in Marietta Borough’s Dry Weather Screening Protocols.
  - The Borough MUST maintain complete records of IDDE program investigations and make them available to PA DEP during field reviews of the permittee’s MS4 program.
  - The Borough’s stormwater ordinance prohibits illicit discharges into the Borough’s stormwater system.



Dry Weather Screening Protocols

- A minimum of 20% of Borough outfalls are screened annually, for a total of 100% inspected by the end of the 5-year term.
  - Each outfall with observed dry weather flow (discharge occurring more than 48 hours after a rainfall event) must be inspected every year, even if the flow was determined to be runoff or groundwater.
- Outfall conditions are inspected using PA DEP's MS4 Outfall Field Screening Report.
- Additional maintenance should be addressed by the Borough or the property owner. Typical maintenance includes:
  - Addressing backfilling/standing water
  - Repairing evidence of erosion
  - Removing sediment/debris accumulation
  - Clearing inlets of debris
  - Repairing broken structures

Outfall with no required maintenance

Outfall that requires maintenance

If an illicit discharge is found …

- Complete the outfall screening form for the relevant outfall and be sure to photograph/accurately describe the nature of the flow.
- If the origin of the flow cannot be identified, a sample of the flow should be collected and tested for the following parameters:

Conductivity	Temperature	Ammonia-Nitrogen	pH	Chlorine
Copper	Detergents	Color	Oil Sheen	Odor
		Trash, Sewage, and Surface Scum		

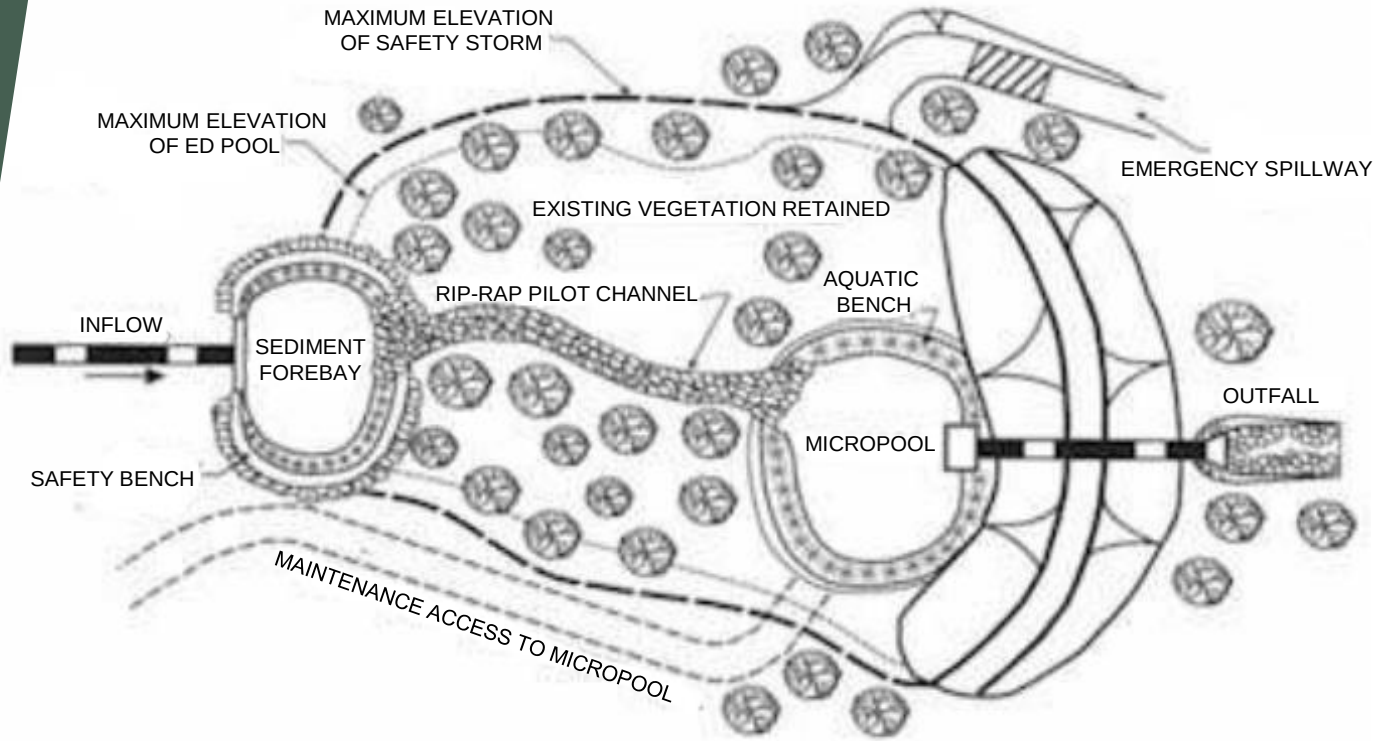
- All attempts should be made to identify the source of the illicit discharge by inspecting upstream stormwater infrastructure. Referencing the MS4 map can aid in narrowing down the search area.

MCM 4: Construction Stormwater Management

- The Borough has an ordinance that requires the implementation and maintenance of **construction** stormwater management for new development and redevelopment projects, including sanctions for non-compliance.
- Examples of stormwater compliance at construction sites:
  - Areas where disturbance ceased for more than four days are stabilized
  - Materials, waste, vehicles and equipment is properly managed and stored
  - Discharges from site do not contain solids, foam, scum, sheen or other substances
  - Proper permits are obtained before construction begins

MCM 5: Post-Construction Stormwater Management

- The Borough has an ordinance that requires the implementation and maintenance of **post-construction** stormwater management for new development and redevelopment projects, including sanctions for non-compliance.
- The Borough is required to conduct regular maintenance activities associated with BMPs. This may include the following:
  - Mowing
  - Plant Composition and Health
  - Trash and Debris Accumulation
  - Sedimentation and Erosion
  - Dewatering
  - Overall Functionality based on Design and Intent



Privately-Owned Stormwater BMPs

Privately-owned BMPs must be maintained as outlined in the operation and maintenance agreement.

The Borough conducts annual BMP inspections. The Borough will contact property owners in the event that a BMP does not pass the Borough’s annual inspection. BMP inspections are based off PA DEP’s Stormwater Design Manual's design and maintenance criteria.

MCM 6: Pollution Prevention and Good Housekeeping Procedures

- The Borough is required to develop and implement an operation and maintenance program that includes a training component to prevent and reduce pollutant runoff from municipal operations. This annual training is aimed to eliminate the discharge of pollutants during municipal operations.
  - Spill Prevention and Response
  - Waste Disposal
  - Routine Visual Inspections to Detect and Correct Potential Discharges At Properties Owned or Operated By The Permittee
- The Borough has developed a list of Standard Operating Procedures (SOPs) for any municipal activity dealing with hazardous materials.
- DEP conducts municipal audits for MS4 permit holders once a permit cycle. The PADEP 2022 MS4 Audit Form (3800-FM-BCW0489) can be found on the PADEP website.

Potential Pollutant Sources

Material Loading and Unloading

- Ex. Bulk chemicals, hypochlorite, petroleum products, etc.

Outdoor storage of materials & equipment

- Ex. soil, mulch, petroleum and machinery storage

Dust or Particulate Generating Processes

- Gravel parking lots or roads

Illicit Connections

- Ex. Plumbing mistakes/cross connections where interior drains discharge to storm sewer

Improper Waste Management

- Ex. Uncovered dumpsters

Ideal Facility Conditions

- Labeled containers
- Easy to access spill kits
- Materials are stored in an overhead area with a door and pushed back behind drip line to prevent access to precipitation
- Equipment is indoors and organized
- Vehicle washing is conducted indoors with a floor drain to the sanitary sewer system

General SOP: LIQUID Spills

- In the event of an accident involving contaminants, make all attempts to prevent the spilled material from entering the storm sewer system or nearby waterways. This could include diking, damming, absorbing, or removing the material from the affected area. Appropriate spill containment and recovery equipment should be equipped on all vehicles that have the potential for a significant fluid spill. A spill containment kit should include liquid absorbent materials such as absorbent pads, and/or sand.
- In the event of a ***liquid*** spill:
  - Absorbent materials should be used on the spill and then immediately swept up and properly disposed of. Dispose of all recovered material properly and in accordance with all applicable state and federal waste disposal regulations.
  - For any spill from vehicles or equipment that requires more than <u>one</u> bag of liquid absorbent material to absorb, or that threatens to enter the storm sewer system, the police department and fire department should be immediately contacted to provide assistance.
  - If a major spill occurs and enters a floor drain, notify the Borough's wastewater treatment facility.

General SOP: SOLID Spills

- Spills should be immediately addressed as this will mitigate the potential for runoff to enter the Borough's MS4. Hazardous material cleanup debris should be disposed in proper containers. Do not allow debris to enter drains that are connected to Borough's stormwater system.
- In the event of a ***solid*** spill:
  - Substances should be swept up immediately and should be properly disposed of. Dispose of all recovered material properly and in accordance with all applicable state and federal waste disposal regulations.
  - For a major spill, where materials threaten to enter the storm sewer system, the Borough Police Department and Fire Department should be immediately contacted to provide assistance.

Spill Response and Notification

- **Minor** spills are considered to be those of **less than 5-gallons** which pose no significant harm to human health or the environment and have not entered the storm sewer system, stormwater pond, water body or the groundwater table.
- **Major** spills are **considered an emergency.** It is a spill that cannot be safely contained by staff or cleaned up and/or has made its way into the storm sewer system, stormwater pond, waterbody or groundwater table or is a threat to human health.
  - If you cause or find a major spill and cannot contact Borough administration, dial **911** for the Fire Department's HAZMAT Unit immediately. You must remain on-site until assistance arrives.

THANK YOU FOR YOUR TIME!

If you have any questions, please contact me at

484.999.6348

or

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