

# LOWER MAKEFIELD TOWNSHIP



## STORMWATER MANAGEMENT 2021 MS4 PROGRAM UPDATE



Presented By Township Engineers:  
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# Permit Requirements

## Minimum Control Measures (MCM)

- ▶ MCM 1 - Public Education and Outreach
- ▶ MCM 2 - Public Involvement and Participation
- ▶ MCM 3 - Illicit Discharge Detection and Elimination
- ▶ MCM 4 - Construction Site Runoff Control
- ▶ MCM 5 - Post Construction Stormwater Management
- ▶ MCM 6 - Pollution Prevention & Good Housekeeping
- ▶ Pollution Reduction Plan
- ▶ PCMs - Pollution Control Measures

# PADEP Permit Schedule

2020 Status

- ▶ MCM 1 - PEOP Updated Annually starting in 2018 Last Updated 2019
  - ▶ Must distribute two types of materials annually
- ▶ MCM 2 - PIPP Updated Annually starting in 2018 Last Updated 2019
  - ▶ Must conduct at least one public meeting dedicated to the MS4 program by 2023.
- ▶ MCM 3 - IDD&E Program Updated Annually starting in 2018 Last Updated 2015
  - ▶ Must have map of entire MS4 system, update and maintain annually (Required since 2013) In Progress
  - ▶ Dry weather inspection of every outfall at least once by 2023. In Progress
  - ▶ SWM Ordinance must be consistent with the DEP 2022 Model Ordinance by September 30, 2022. Last Updated 2011
- ▶ MCM 4 - Annual Reports on any violations Submitted in 2019
- ▶ MCM 5 - Full Inventory of PCSM BMPs with O&M Activities starting 2018 In Progress
- ▶ MCM 6 - O&M Plan Updated Annually starting in 2018 Last Updated 2019
  - ▶ Must update inventory of Operations and Land Uses that may contribute to pollution in SW Runoff annually Last Updated 2019
  - ▶ Develop and annually update employee training to abide by O&M Plan. Last Updated 2019

# PADEP Permit Schedule

2021 Status

- ▶ MCM 1 - PEOP Updated Annually starting in 2018 Updated 2021
  - ▶ Must distribute two types of materials annually
- ▶ MCM 2 - PIPP Updated Annually starting in 2018 Last Updated 2021
  - ▶ Must conduct at least one public meeting dedicated to the MS4 program by 2023.
- ▶ MCM 3 - IDD&E Program Updated Annually starting in 2018 Last Updated 2021
  - ▶ Must have map of entire MS4 system, update and maintain annually (Required since 2013) Pending Approval
  - ▶ Dry weather inspection of every outfall at least once by 2023. In Progress
  - ▶ SWM Ordinance must be consistent with the DEP 2022 Model Ordinance by September 30, 2022. Currently Reviewing
- ▶ MCM 4 - Annual Reports on any violations Submitted in 2020
- ▶ MCM 5 - Full Inventory of PCSM BMPs with O&M Activities starting 2018 Submitting in 2021
- ▶ MCM 6 - O&M Plan Updated Annually starting in 2018 Updated 2021
  - ▶ Must update inventory of Operations and Land Uses that may contribute to pollution in SW Runoff annually Updated 2021
  - ▶ Develop and annually update employee training to abide by O&M Plan. Updated 2021

# PADEP Permit Schedule

2020 Status

- ▶ Pollution Reduction Plan (PRP) Was Due 2017
  - ▶ Develop mapping with delineated sewersheds **In Progress**
  - ▶ Calculate pollutant loadings
  - ▶ Determine reduction requirements
  - ▶ Identify BMPs to meet reduction requirements
- ▶ PCMs - Pollution Control Measures
  - ▶ Develop mapping with delineated sewersheds - was due 2019 **In Progress**
  - ▶ Create Source Inventory - due 2020
  - ▶ Investigate all potential sources and submit a report of findings - due 2022 **In Progress**
- ▶ Animal Waste Ordinance or SOP - due 2022
- ▶ Report Demonstrating Compliance with PRP due 5 years after approval of plan.

# PADEP Permit Schedule

2021 Status

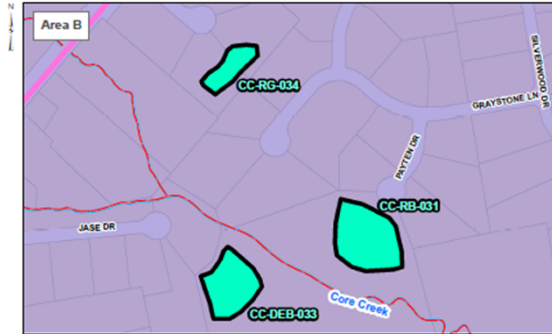
- ▶ Pollution Reduction Plan (PRP) Was Due 2017
  - ▶ Develop mapping with delineated sewersheds **Completed**
  - ▶ Calculate pollutant loadings **Completed**
  - ▶ Determine reduction requirements **Completed**
  - ▶ Identify BMPs to meet reduction requirements **Completed**
- ▶ PCMs - Pollution Control Measures
  - ▶ Develop mapping with delineated sewersheds - was due 2019 **Completed**
  - ▶ Create Source Inventory - due 2020 **Submitting in 2021**
  - ▶ Investigate all potential sources and submit a report of findings - due 2022 **In Progress**
- ▶ Animal Waste Ordinance or SOP - due 2022
- ▶ Report Demonstrating Compliance with PRP due 5 years after approval of plan.

# PRP Submissions

- ▶ PRP
  - ▶ Submitted DRAFT with 2020 Annual Report
  - ▶ Received Comments December 2020
  - ▶ Coordinated with DEP to address comments
    - ▶ 1/19/2021
    - ▶ 2/5/2021
    - ▶ 5/5/2021
  - ▶ Will be resubmitting to DEP July 2021
  - ▶ Public Comment Period will begin August 1, 2021
  - ▶ Final DEP submission will be with 2021 Annual Report

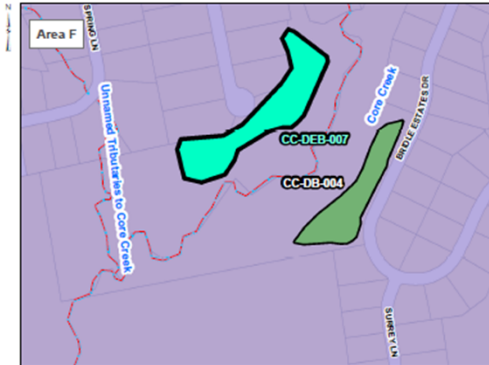
# PRP Completed BMPs

## Rain Garden, Retention Basin, and Extended Detention Basin



Brookshire Development  
(All Basins Installed in 2018)

## Extended Detention Basin

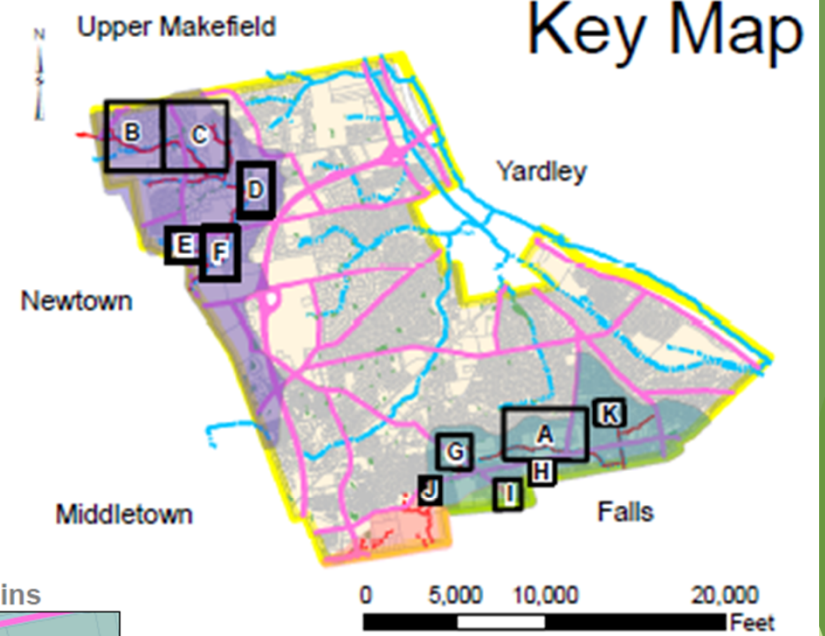


Oakmont Development  
(CC-DEB-007 Installed in 2019)

## Extended Detention Basins



Freemans Farm Development  
(All Basins Installed in 2019)

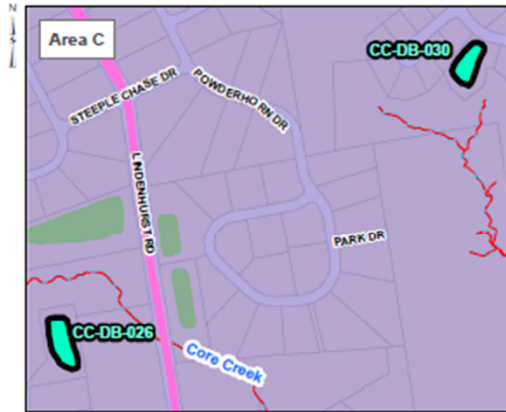


Completed BMP Name	Year Built	Location	BMP Sediment Load Reduction (lbs/year)
CC-DEB-007 (Dry Extended Basin)	2019	South of Silver Stream Drive	1,610.31
CC-RB-031 (Retention Basin)	2018	South of Payten Drive	625.68
CC-DEB-033 (Dry Extended Basin)	2018	East of Jase Drive	621.03
CC-RG-034 (Rain Garden)	2018	West of Tristan Way	331.86
RR-DEB-023A (Dry Extended Basin)	2019	Parallel to Chapman's Court	1,469.82
RR-DEB-023B (Dry Extended Basin)	2019	Parallel to Chapman's Court	170.06
RR-DEB-023C (Dry Extended Basin)	2019	Parallel to Chapman's Court	784.01
<b>Total:</b>			<b>5,612.78</b>

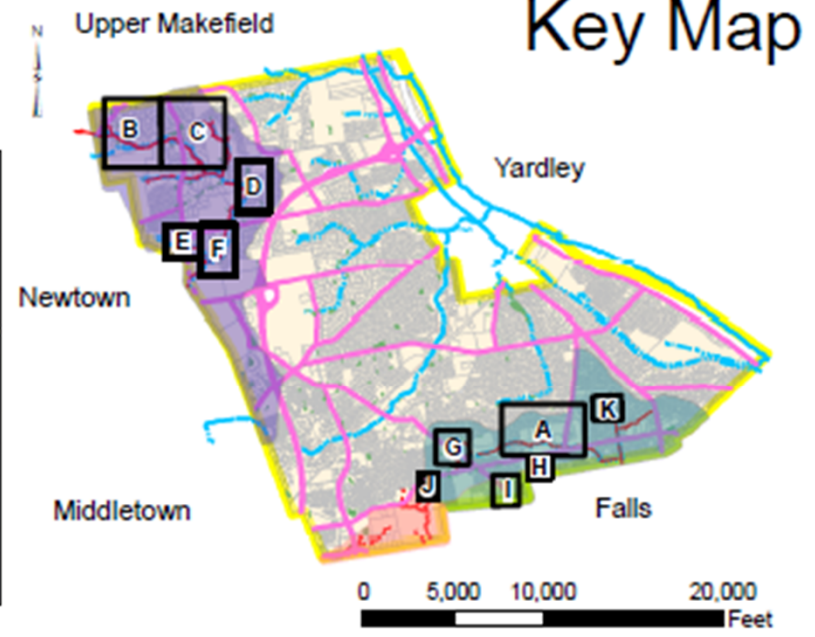
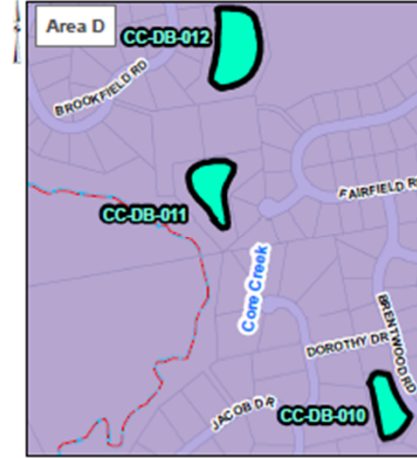


# PRP Proposed BMPs

Basin Retrofit



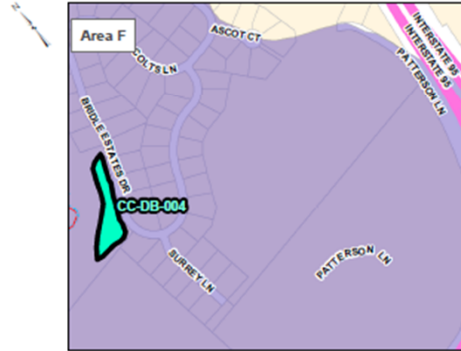
Basin Retrofit



Basin Retrofit

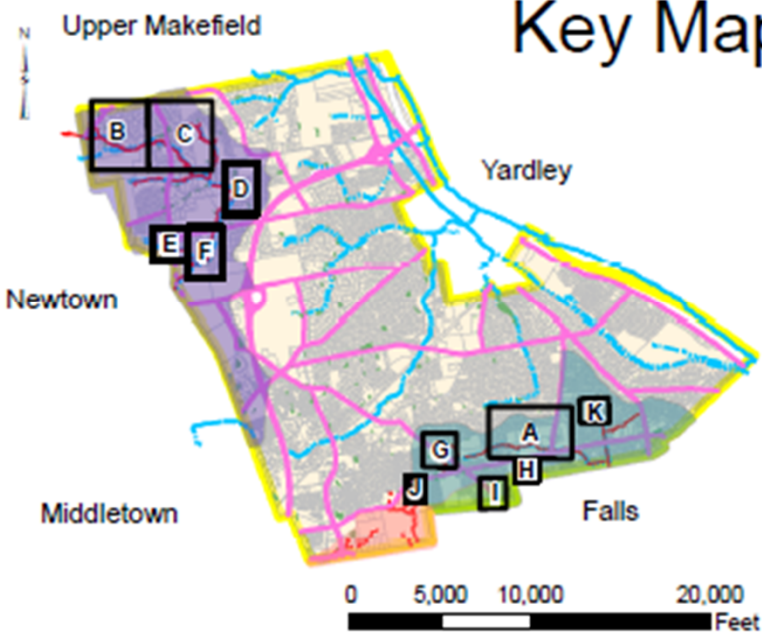
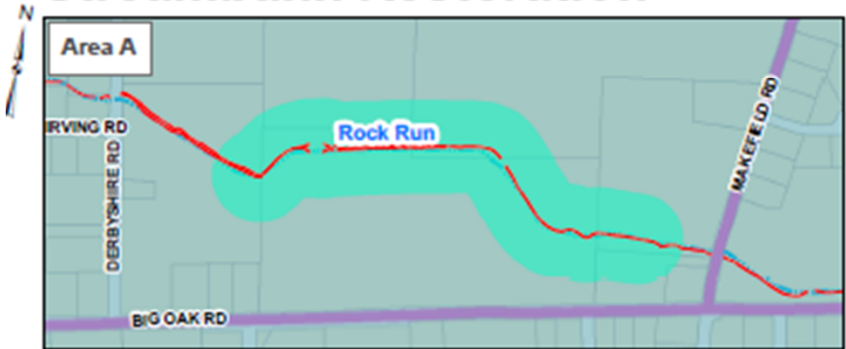


Basin Retrofit

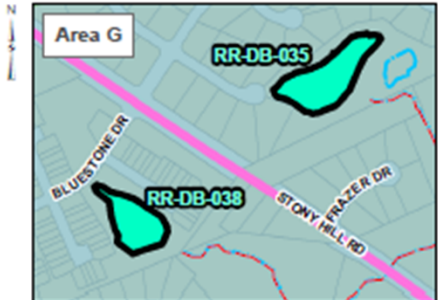


# PRP Proposed BMPs

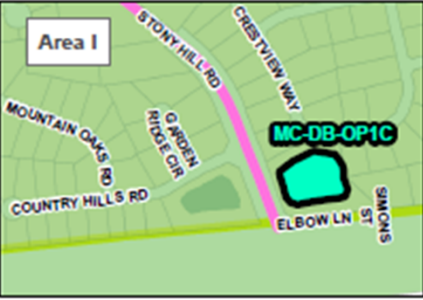
## Charles Boehm Middle School Streambank Restoration



### Basin Retrofit



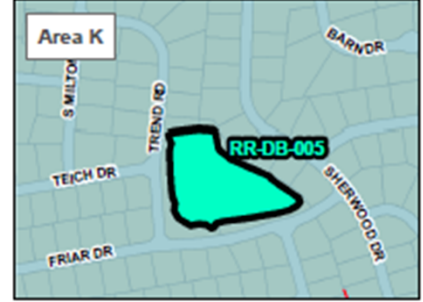
### Basin Retrofit



### Pervious Pavement



### Basin Retrofit



# PRP Proposed BMPs

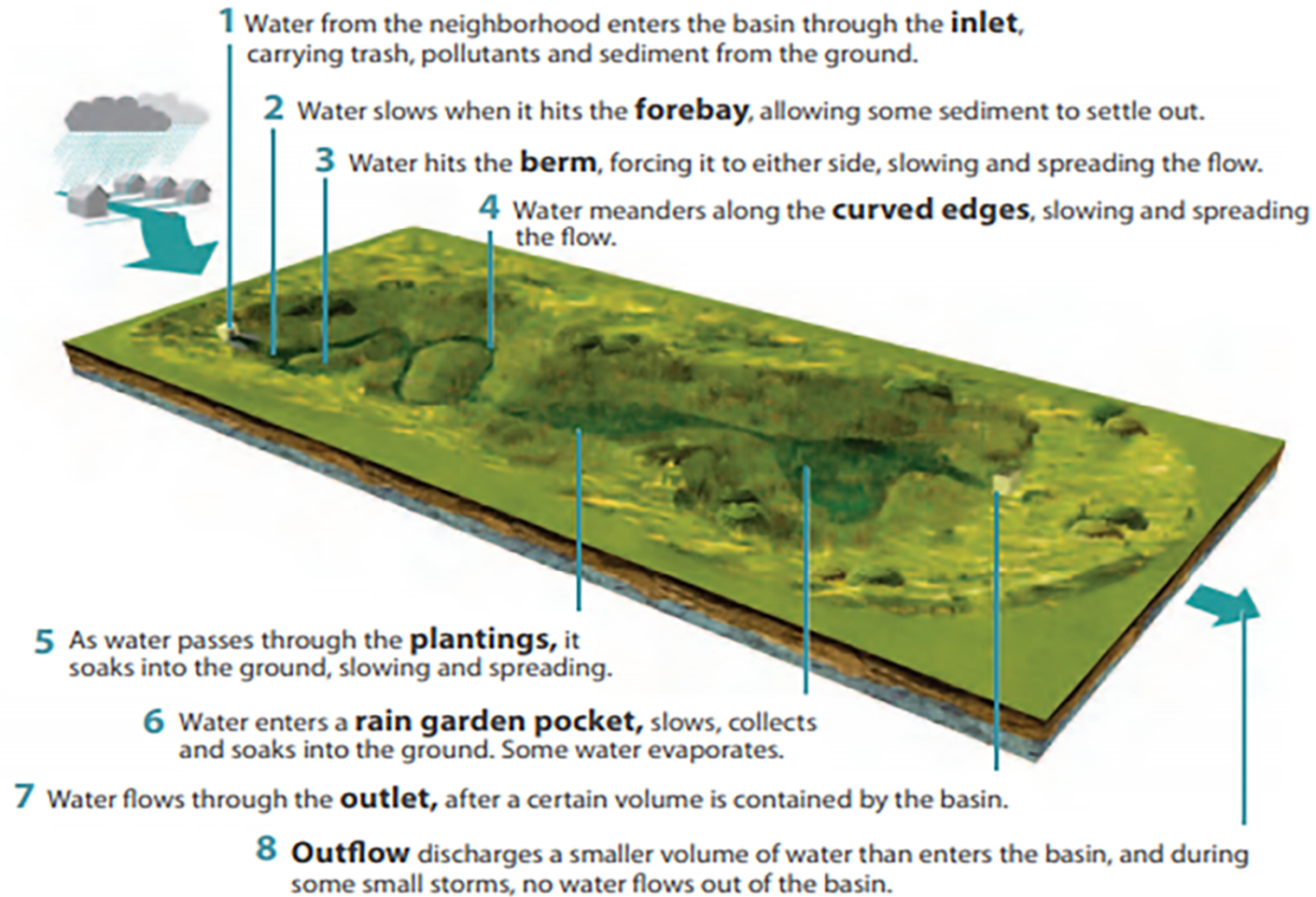
Proposed BMP Name	BMP Location	BMP Type	Estimated Size	Units	Cost Estimate*	BMP Sediment Load Reduction (lbs/year)
Charles Boehm Middle School Streambank/Floodplain Restoration	South of Charles Boehm Middle School	Streambank Restoration	1,400	LF	\$483,338.00 to \$580,006.00	47,124.00
Basin CC-DB-004 Retrofit	West of Intersection of Surrey Ln and Bridle Estates Dr	Detention Basin to Retention Basin	63,000	SF	\$214,800.00 to \$257,760.00	20,067.82
Basin CC-DB-008A Retrofit	South of Wyngate Dr	Detention Basin to Retention Basin	129,500	SF	\$427,950.00 to \$513,540.00	18,107.58
Basin CC-DB-008B Retrofit	Northeast of the Intersection of Lindenhurst Rd and Quarry Rd	Detention Basin to Retention Basin	30,000	SF	\$116,000.00 to \$139,200.00	2,952.56
Basin CC-DB-010 Retrofit	Southwest of the Intersection of Brentwood Rd and Dorothy Rd	Detention Basin to Retention Basin	40,200	SF	\$148,120.00 to \$177,744.00	5,185.99
Basin CC-DB-011 Retrofit	West of Horseshoe Bend	Detention Basin to Retention Basin	47,300	SF	\$190,630 to \$228,756.00	10,212.74
Basin CC-DB-012 Retrofit	South of Greenbriar Ct	Detention Basin to Retention Basin	79,000	SF	\$300,900.00 to \$361,080.00	9,197.52
Basin CC-DB-026 Retrofit	Northeast of Trowdridge Dr	Detention Basin to Retention Basin	30,800	SF	\$141,480.00 to \$169,776.00	4,538.19
Basin CC-DB-030 Retrofit	Southeast of Farmview Dr	Detention Basin to Retention Basin	23,400	SF	\$110,540 to \$132,648.00	4,817.30
Basin RR-DB-005 Retrofit	Northeast of the intersection of Trend Rd and Friar Dr	Detention Basin to Retention Basin	162,700	SF	\$541,360.00 to \$649,644.00	56,503.20
Basin RR-DB-035 Retrofit	East of Pondview Ct	Detention Basin to Retention Basin	79,400	SF	\$286,140.00 to \$343,368.00	11,601.58
Basin RR-DB-038 Retrofit	East of S Fieldstone Ct	Detention Basin to Retention Basin	52,700	SF	\$189,870.00 to \$227,844.00	8,577.04
Basin MC-DB-OP1C Retrofit**	Northeast of the Intersection of Stony Hill Rd and Elbow Ln	Detention Basin to Retention Basin	53,900	SF	\$200,090.00 to \$240,2018.00	9,432.31
Pervious Pavement (QA-PEP-01)**	Five Mile Park Parking Lot	Pervious Pavement Installation	130,680	SF	\$247,760.00 to \$297,312.00	1,210.82
				<b>Total</b>	<b>\$3,595,988.00 to \$4,318,786.00</b>	<b>209,528.64</b>

\*All costs and ranges for BMP Implementation Projects were developed from direct contractor bids for previous BMP Projects. They were scaled specifically to the current size of each project.

\*\*These projects are required to meet the reduction requirements per that specific watershed.

# Basin Retrofit

## What Happens to Stormwater in a *Retrofitted* Detention Basin?





# MCM 4 - Construction Site Runoff Control

- ▶ Develop procedures for managing construction runoff involving plan review, site inspection, and enforcement for erosion and sediment control measures

## How do we comply?

- ▶ Earth disturbance over 2,000 sf requires E&S review
- ▶ Routine Construction Inspections
- ▶ Notice of E&S Violation Issuance



## MCM 4 - Construction Site Runoff Control

- ▶ We have increased efforts to issue NOVs to insure a culture of compliance
- ▶ 1/5/2021 - Yardley Woods Development
- ▶ 1/8/2021 - Caddis Development
- ▶ 2/17/2021 - Yardley Woods Development
- ▶ 4/12/2021 - 1150 Big Oak Road

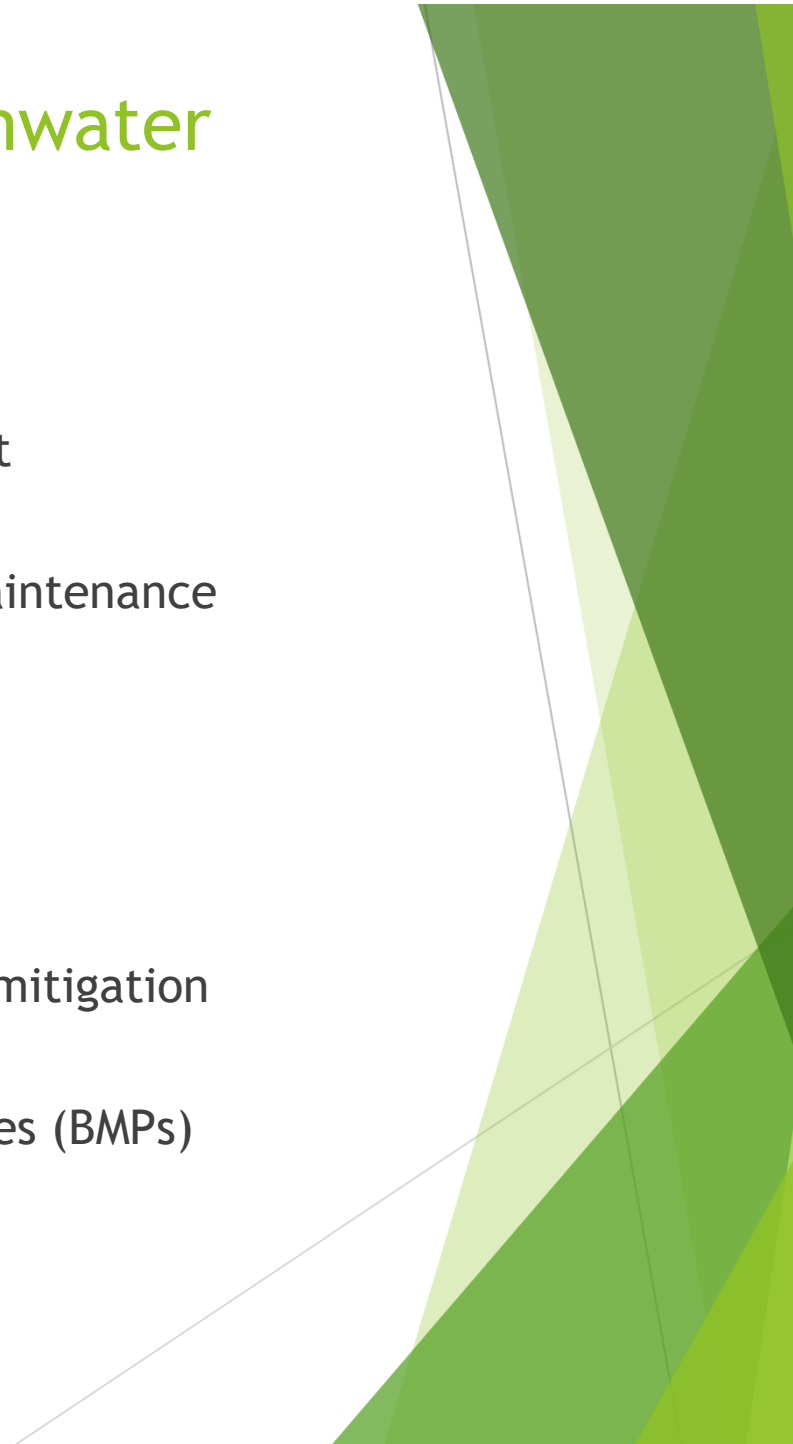


# MCM 5 - Post Construction Stormwater Management

- ▶ Develop ordinance for controlling development stormwater
- ▶ Establish plans for long term operation and maintenance

## How do we comply?

- ▶ Additional Impervious area needs stormwater mitigation
- ▶ Require an Operation and Maintenance (O&M) agreement for constructed stormwater facilities (BMPs)



# MCM 5 - Post Construction Stormwater Management

- ▶ 30 Permits Issued Thus Far in 2021
- ▶ Almost 50 Permits Issued in 2020
- ▶ Almost all projects included BMPs with signed O&M agreements from property owners





# 2022 Stormwater Ordinance

3800-PM-BCW0100] Rev. 4/2018  
Model Ordinance

## Article I – General Provisions

Section 101.	Short Title
Section 102.	Statement of Findings
Section 103.	Purpose
Section 104.	Statutory Authority
Section 105.	Applicability
Section 106.	Repealer
Section 107.	Severability
Section 108.	Compatibility with Other Requirements
Section 109.	Erroneous Permit
Section 110.	Waivers

## Article II – Definitions

## Article III – Stormwater Management Standards

Section 301.	General Requirements
Section 302.	Exemptions
Section 303.	Volume Controls
Section 304.	Rate Controls
Section 305.	Riparian Buffers

## Article IV – Stormwater Management Site Plan Requirements

Section 401.	Plan Requirements
Section 402.	Plan Submission
Section 403.	Plan Review
Section 404.	Modification of Plans
Section 405.	Resubmission of Disapproved SWM Site Plans
Section 406.	Authorization to Construct and Term of Validity
Section 407.	As-Built Plans, Completion Certificate and Final Inspection

## Article V – Operation and Maintenance

Section 501.	Responsibilities of Developers and Landowners
Section 502.	Operation and Maintenance Agreements

## Article VI – Fees and Expenses

Section 601.	General
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## Article VII – Prohibitions

Section 701.	Prohibited Discharges and Connections
Section 702.	Roof Drains and Sump Pumps
Section 703.	Alteration of SWM BMPs

## Article VIII – Enforcement and Penalties

Section 801.	Right-of-Entry
Section 802.	Inspection
Section 803.	Enforcement
Section 804.	Suspension and Revocation
Section 805.	Penalties
Section 806.	Appeals

## Article IX – References

## Appendix A – Operation and Maintenance Agreement

# Pollution Control Measures

- ▶ Appendix B - Pathogens (Neshaminy)
  - ▶ Fecal Coliform
- ▶ Appendix C - Priority Organic Compounds (Martin's Creek & Delaware River)
  - ▶ Polychlorinated Biphenyls (PBCs) & Pesticides
    - ▶ Mapping **Completed**
    - ▶ Source Inventory **Completed**
    - ▶ Investigation **In Progress**
    - ▶ Report

# Township Compliance

- ▶ Mapping Completed
- ▶ Budget for on-going Field Verification of Mapping
- ▶ Construct/Retrofit BMPs
- ▶ Have EAC collaborate with Yardley Borough EAC to Investigate Potential Sources
- ▶ Revise SW Ordinance
- ▶ Expand Animal Ordinance Specifications for Animal Waste



# Questions?

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- ▶ Andrew Pockl, PE, CFM - [Andrew.Pockl@rve.com](mailto:Andrew.Pockl@rve.com)