

City of Fort Wayne PC BMP Program



Presenter: Charlie Cochran
City Utilities
Fort Wayne, Indiana
Indiana MS4 Partnership
5/12/2026

City of Fort Wayne PC BMP Program



- Charlie Cochran – SWPPP Program Manager
 - Manage the Construction Site Runoff / Post Construction Stormwater Runoff Programs for MS4GP
 - 18yrs working for Fort Wayne:
 - Complaint investigations, project studies, project designs, project reviews, construction management, and post construction management.
 - Work heavily with the community, developers, and engineers

City of Fort Wayne PC BMP Program



- Fort Wayne's History
 - Established a Stormwater Utility in 1991 (35 years ago)
 - Implemented our NPDES Permit in 2004
 - Stormwater Utility leads
 - SWP3 Ordinances dating back to 2008
 - Requiring SWP3 Applications for Developments >1acre in 2008
 - Several Employee Generations of Implementation
 - Designated a SWP3 Program Manager in 2022
 - Focus Construction Monitoring and SWP3 Implementation
 - Ramp Up Post Construction Program

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- Construction Program:
 - Plan review processes are the same for past 25+ years.
 - Program in place: Engineers identified pollutants, proposed many BMPs to manage stormwater Run-off all meeting the requirements of our Design Standards Manual
 - Construction Monitoring has matured greatly.
 - Prior to 2022:
 - SWP3 Inspectors were also Utility Construction Project Managers
- Post Construction Program:
 - Prior to 2018:
 - Engineers identified pollutants, proposed many BMPs to manage stormwater Runoff all meeting the requirements of our Design Standards Manual
 - 2018
 - began developing ideas to create a standardized system to manage a program on Post Construction BMPs
 - 2023
 - Solidified standardized BMPs. Ramping up began on Post Construction Program
 - 2024
 - Began Public Rollout of BMP program

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- Which BMPs need inspected and How?

- 100+ Different Types of BMPs that we found that have been identified**



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- Developing a Standardization of BMPs
- What is their intent?
 - They are designed to treat stormwater runoff in some fashion.
- Make it basic, can we generalize a “system”? What is it’s function
 - How are they generally shaped?
 - Where are they generally located?
 - What is their general function?
- 4 basic systems

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1st “System:” Underground

- Beneath the ground
- Proprietary Units
- Underground Detention
- Underground Infiltration Galleries
- Catch Basin BMPs

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2nd “System:” Linear

- Follow some alignment
- Vegetated Filter Strips
- Infiltration Trenches
- Biofilters or Bioswales

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3rd “System:” Basins

- Cover an area, take up a volume
- Bioretention
- Constructed Wetland
- Wet Extended Detention
- Dry Extended Detention
- Surface Bed Filters

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4th “System:” Pavement

- A Pretreatment System to filter the water
- Permeable Pavement

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- Able to fit all BMPs into 13 types
 - Much easier to handle
 - Build Standard Inspection
 - Aided Inventory Management
1. Proprietary Units
 2. Underground Detention
 3. Underground Infiltration Galleries
 4. Catch Basin BMPs
 5. Vegetated Filter Strips
 6. Infiltration Trenches
 7. Biofilters or Bioswales
 8. Bioretention
 9. Constructed Wetlands
 10. Wet Extended Detention
 11. Dry Extended Detention
 12. Surface Bed Filters
 13. Permeable Pavement

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Inventory

- How many BMPs do we have?
- What BMPs Inventories do we have?
 - Spreadsheets
 - Maintenance Agreements
 - Private Development Data
 - Project data in GIS, and
 - Mapped Facilities
 - City Capital Project data
 - Project data in GIS, and
 - Mapped Facilities

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Where should we store the information?

- Selected to use GIS database
 - BMPs broken down by 13 types and the **Ownership** is Identified
 - Private
 - City Fire, City Police, City Parks, City Utilities, Community Development, Public Works, Airport Authorities
 - Other MS4s
- Can house inspection records here (PAPERLESS)

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Inspection

- GIS Tools
 - Developed a basic map using Field Maps
 - Developed 13 unique inspection forms using Survey 123
 - Developed a dashboard to review the inspections
 - Developed a dashboard to track reporting metrics
- Who is Inspecting?

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Who Inspects the BMP?

- Estimating 2,000+
- Stormwater rate does not support City Inspections
- Private BMPs
 - City Requires Maintenance Agreements for all Private Development?
 - In the maintenance agreement a responsible party is identified.
 - 199/200 it is the landowner.
 - Implemented a Self Inspection Program.
 - If you own it, it's yours to inspect. You can hire someone to do for you, if you chose.
 - **Annually**
 - Educate, Educate, Educate,
 - Generate Materials
 - Generate Instructions
 - Make available Time (over 30 events in 2025)
 - Walk through the inspection platform, explain in person how their facilities function, and what they need to look at.

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Who Inspects the BMP?

- Estimating appx. 3,000 BMPs
 - Stormwater Rate does not support city inspection
- City Requires Maintenance Agreements for all Private Development?
 - In the maintenance agreement a responsible party is identified.
 - 199/200 it is the landowner.
 - Implemented a Self Inspection Program.
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 - **Annually**

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- Non-Private BMPs
 - City Department/Co-Permittees/Airport Authority Coordination.
 - Meetings
 - Education on MS4 Permit
 - Departments are catching on
 - Still Implementing uniform inspection program
- Other MS4 Co-Permittees
 - Some are utilizing
 - We created the database and structure
 - Others have their own process

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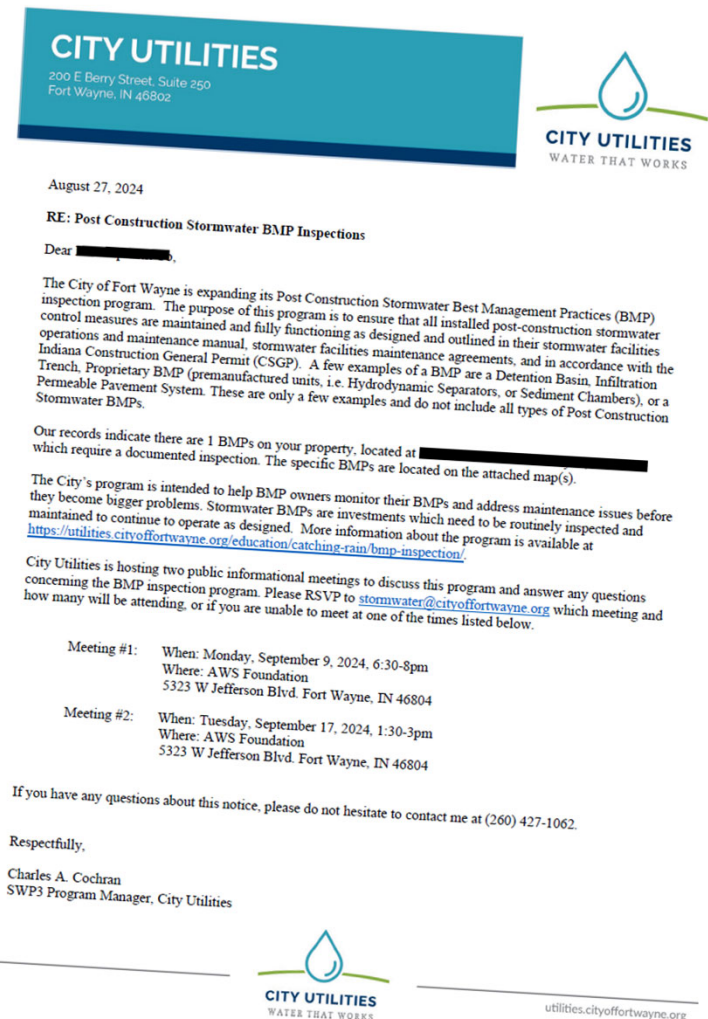
- Why Annual Inspections?
 - Make corrections before blowing up.
 - Education
 - Keep the BMPs in the presence of the owner's mind.



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- Educate, Educate, Educate,
 - Generate Materials
 - Generate Instructions
 - Make available Time (over 30 events in 2025)
 - Walk through the inspection platform, explain in person how their facilities function, and what they need to look at.



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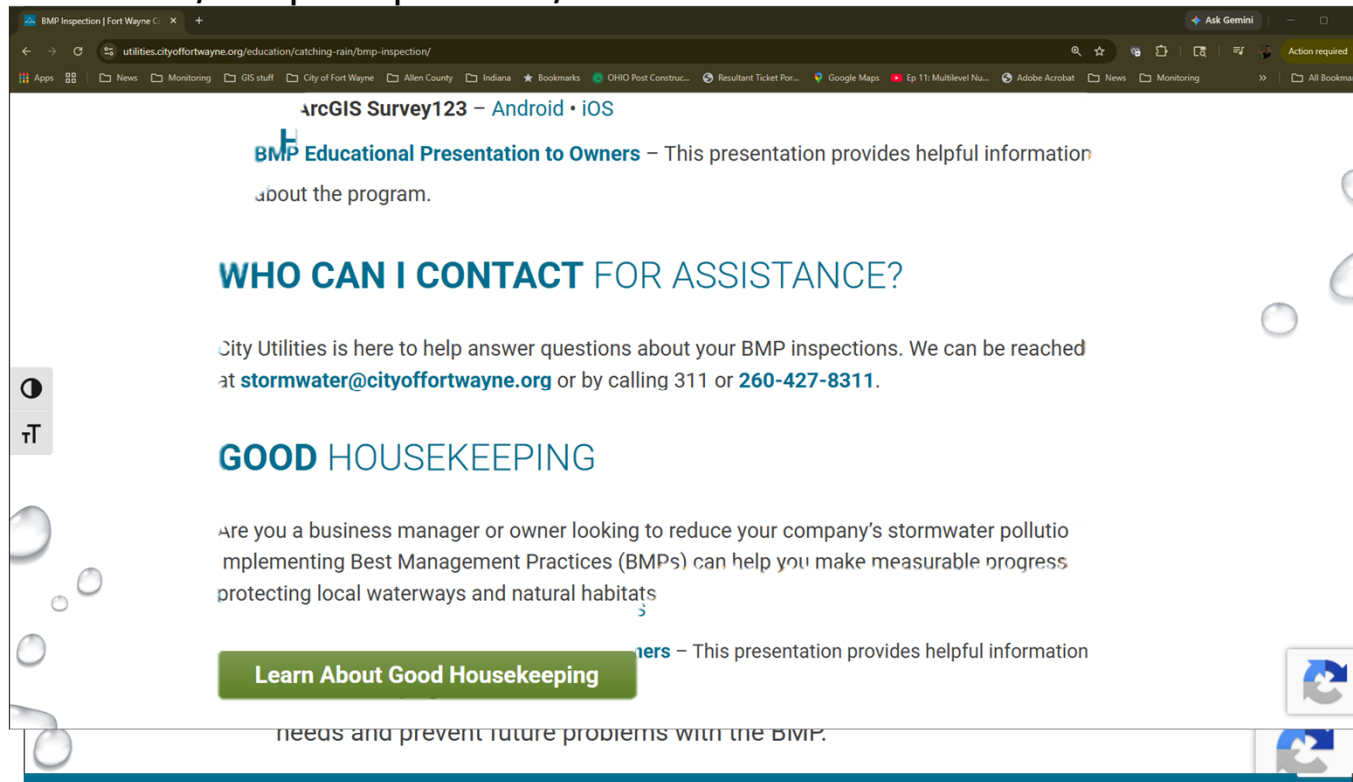
- Education Materials Developed



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- Website Materials Focused on Private Owners
 - <https://utilities.cityoffortwayne.org/education/catching-rain/bmp-inspection/>



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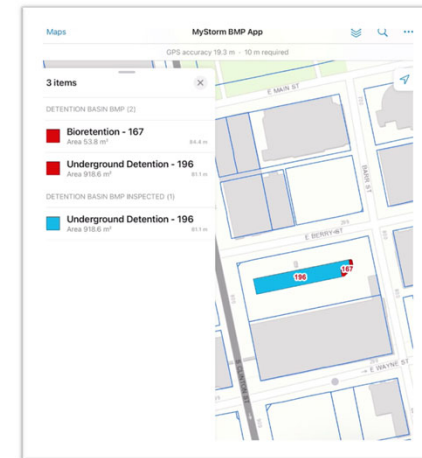
SOP Materials for Inspectors

- What devices can be used.
- How to connect to database.
- How to record an inspection.
- How to identify if your inspection was recorded.

- Allows users to inspect their assets
- Mobile devices with Cellular / Wifi connection
- Utilizes “ArcGIS Field Maps” and “ArcGIS Survey 123”



Catching Rain BMP app



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- Property Owners Guide to BMP Maintenance

Property Owner's Guide Stormwater BMP Maintenance

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- Property Owners Guide to BMP Maintenance

Property Owner's Guide to Stormwater BMP Maintenance

1.0 Introduction

What is Stormwater?

Stormwater (sometimes called stormwater runoff) is created when it rains and the water does not soak into the soil, or when snow melts and flows across the surface of the ground. The amount of runoff depends on how much it rains or snows, how quickly or intensely it falls, how much water is already in the soil (saturated soils won't allow water to soak in). Land cover is a particularly important factor in the amount of stormwater created. As land is developed and natural vegetation and soil are replaced with impervious surfaces (buildings, parking lots, and other hard surfaces), stormwater is generated much more quickly and in larger volumes. As more development occurs, even more stormwater is produced due to increasing amounts of impervious surfaces. This is why many cities and towns experience more flooding and stream erosion as they grow.

More stormwater also leads to more water pollution. As stormwater runs off rooftops and travels over driveways, parking lots, yards, and roads, it washes away what is on the ground. This includes dirt (sediment), litter, animal waste, pesticides and herbicides used on lawns and landscaping, oils

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- Property Owners Guide to BMP Maintenance

Property Owner's Guide to Stormwater BMP Maintenance

What are Stormwater BMPs?

Stormwater Best Management Practices (usually just called BMPs) are structural and non-structural practices designed to store stormwater permanently (retain) or temporarily (detain). Many BMPs are also designed to treat polluted stormwater. They retain, detain, and treat stormwater to reduce flooding, erosion, and pollution problems caused by the loss of natural landscape and the increase of roads and buildings and other impervious surfaces that result from land development.

There are many types of BMPs. Some are designed to temporarily store (detain) stormwater to allow pollutants to settle, filter, or otherwise be removed before the stormwater is released. BMPs can often be designed to release stormwater very slowly and in small amounts over several days, rather than in a big rush during a storm. A special set of BMPs, called green infrastructure BMPs, use loose soil and plants to mimic a natural landscape. These BMPs allow stormwater to soak into the ground and replenish groundwater rather than run off. Plants can also absorb water and utilize some pollutants as food/fuel. This both reduces the amount of stormwater and prevents pollutants from being washed into local streams, rivers, and lakes.

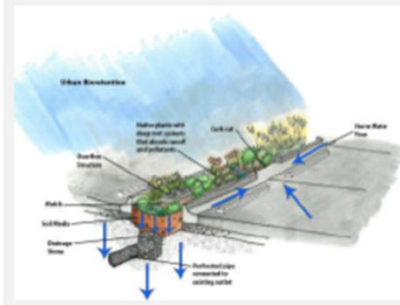
Why are BMPs Important to Me?

Stormwater BMPs control the stormwater that is

BMPs can look like typical landscaping...



...but they are working to manage stormwater.



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- Property Owners Guide to BMP Maintenance

Property Owner's Guide to Stormwater BMP Maintenance

Are There Prohibited Uses for a BMP on My Property?

Yes, there are uses that are not allowed for a BMP on your property. There are activities that can inexplicably lead to encroachments and uses that can damage a BMP and lead to flooding, erosion, or pollutant discharges. The table on the following page lists the activities and uses prohibited for stormwater BMPs. Owners should be familiar with this list and take care not to allow a prohibited activity or use in or on their BMP.

PROHIBITED ACTIVITIES AND USES OF STORMWATER BMPS

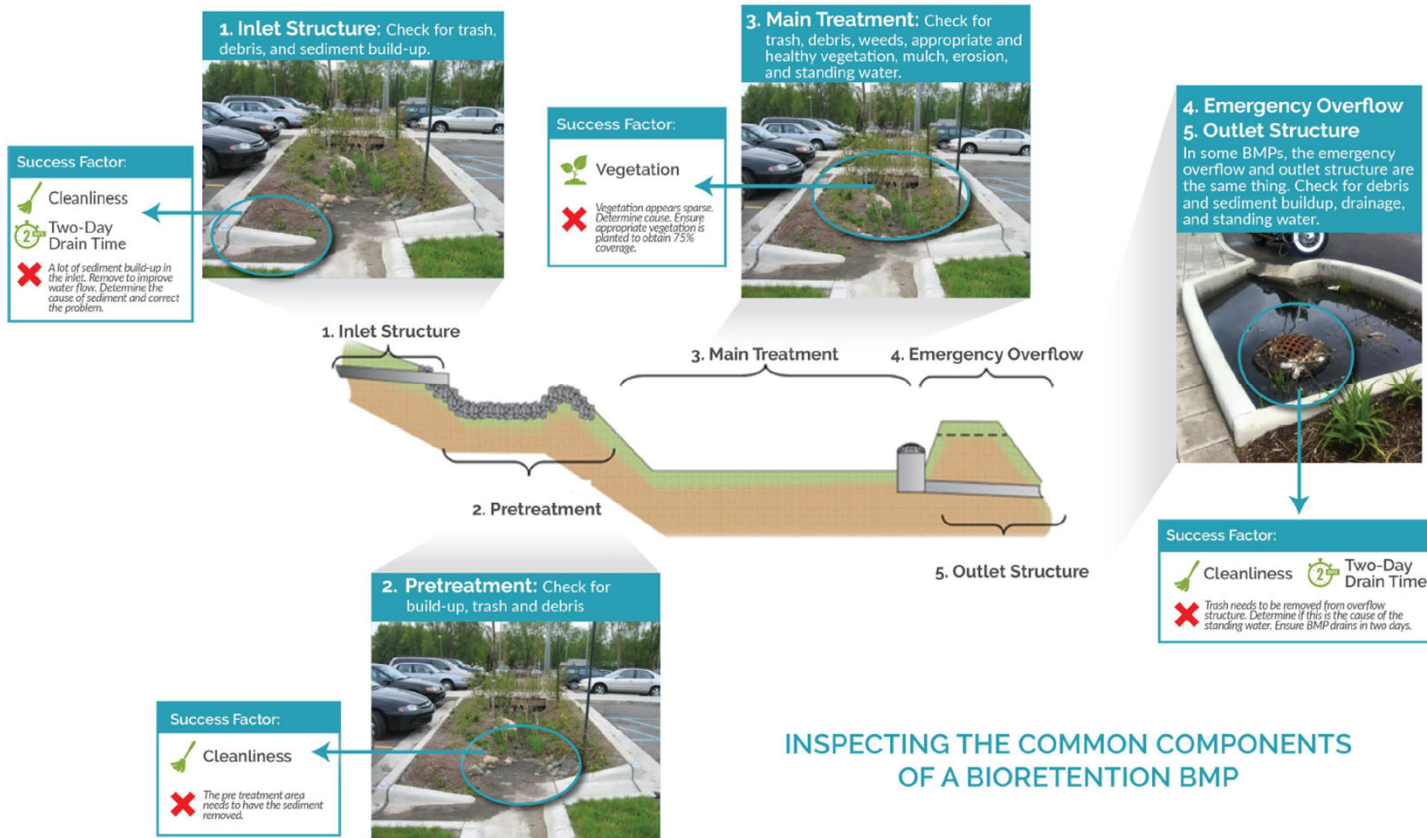
Prohibited Activities	Prohibited Uses
✗ Spraying, filling, and dumping of any material, household/commercial waste, or sewage ✗ Sewage or waste storage or disposal ✗ Use of heavy equipment during maintenance activities (infiltration GI-BMP only) ✗ Foot traffic unrelated to maintenance activities (infiltration GI-BMP only) ✗ Incorrectly parked vehicles ✗ Pet and livestock feeding, relief or play areas ✗ Installation of impervious surfaces unrelated	✗ Sewage storage or treatment area/system ✗ Storage of vehicles, equipment, materials, pesticides, herbicides, fertilizers, or wastes ✗ Storage of vehicles or equipment under repair (e.g., an auto repair shop) or in disrepair (e.g., a junk yard) ✗ Vehicle traffic or parking (allowed for permeable or porous pavement) ✗ Materials or waste storage areas ✗ Dog parks, pet kennels and livestock corrals,

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• Property Owners Guide to BMP Maintenance

Property Owner's Guide to Stormwater BMP Maintenance
City of Fort Wayne IN



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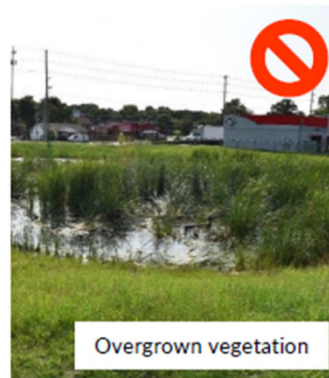


- Property Owners Guide to BMP Maintenance

What Does Success
Look Like?



What Does Failure
Look Like?



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- Property Owners Guide to BMP Maintenance

Example 3: Detention BMP Success Factors (extended wet detention, maintenance needed)



Success Factor 1: Vegetation
Top Picture: No signs of erosion or bare soil. However, the overgrowth of cattails in the main treatment area could cause problems such as muskrat burrowing. Reduce or remove and control cattails to allow a large open water area.
Bottom Picture: There are signs of erosion and bare soil around the perimeter of the Detention BMP. This is also causing the inlet failure. Revegetation needs to occur.



Success Factor 2: Two-Day Drain Time
Top Picture: The water level is appropriate for the season and rainfall conditions. Inlet structures are visible and in good condition, but the outlet structure cannot be inspected due to cattails.
Bottom Picture: The water level is appropriate for the season.



Success Factor 3: Protection
Top and Bottom Picture: There are no signs of damage by vehicles, equipment, or people.



Success Factor 4: Cleanliness
Top Picture: Cattail overgrowth is a problem and can lead to clogging. Possible animal issues can lead to damage in the main treatment area.
Bottom Picture: There is evidence of algae in water, this should be further investigated.

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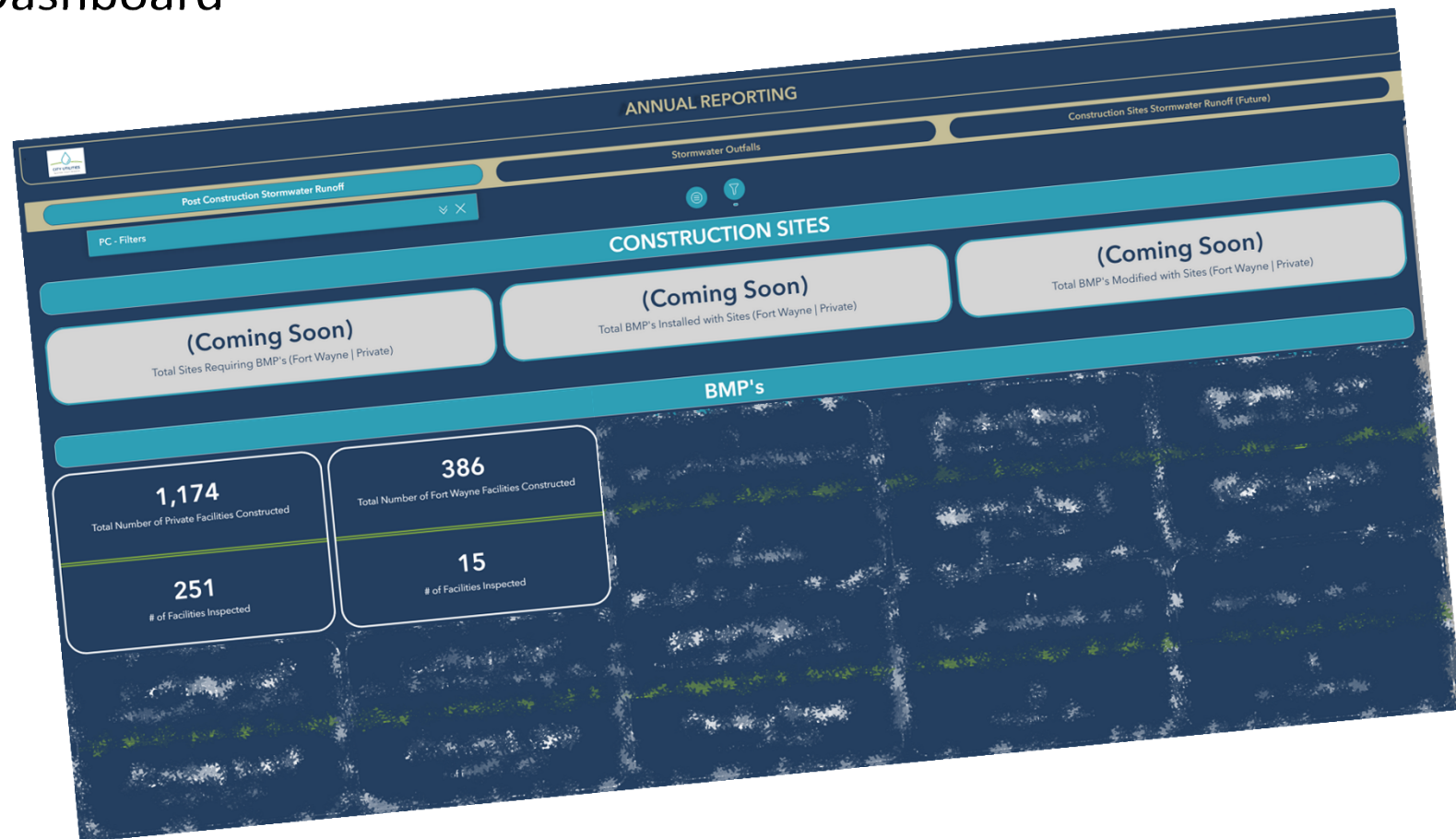


- How do you consume the Information?

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- Reporting Dashboard



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- BMP Inspection Dashboard

CATCHING RAIN - BMP INSPECTIONS

Facilities Inspected: 267 Inspections Logged: 317 114 Inspections Need Further Review

Map View Inspection Attachments View Inspection Content Editor

Click Here to Pan to N62 357 on the Map

Facility ID Inspected Date

- Proprietary BMP**
N62 357
3/30/26, 1:08 PM
10806 E Rosewood Cir
- Proprietary BMP**
N62 200
3/30/26, 12:45 PM
314 Marcelle Dr
- Proprietary BMP**
N62 198
3/30/26, 12:34 PM
10711 Lone Eagle Way
- Proprietary BMP**
H03 171
3/30/26, 11:01 AM
Dawsons Creek Blvd
- Proprietary BMP**
H03 171
3/30/26, 10:25 AM
2201 Ardmore Ave
- Catch Basin**
K19 163
3/30/26, 9:47 AM
1626 Mayflower Rd

Last update: a few seconds ago

Potential Problems Identified
Main Treatment Blocked: Yes
Pretreatment Blocked: Yes
Inspection Requires Further Review: Yes

Inspection Details:

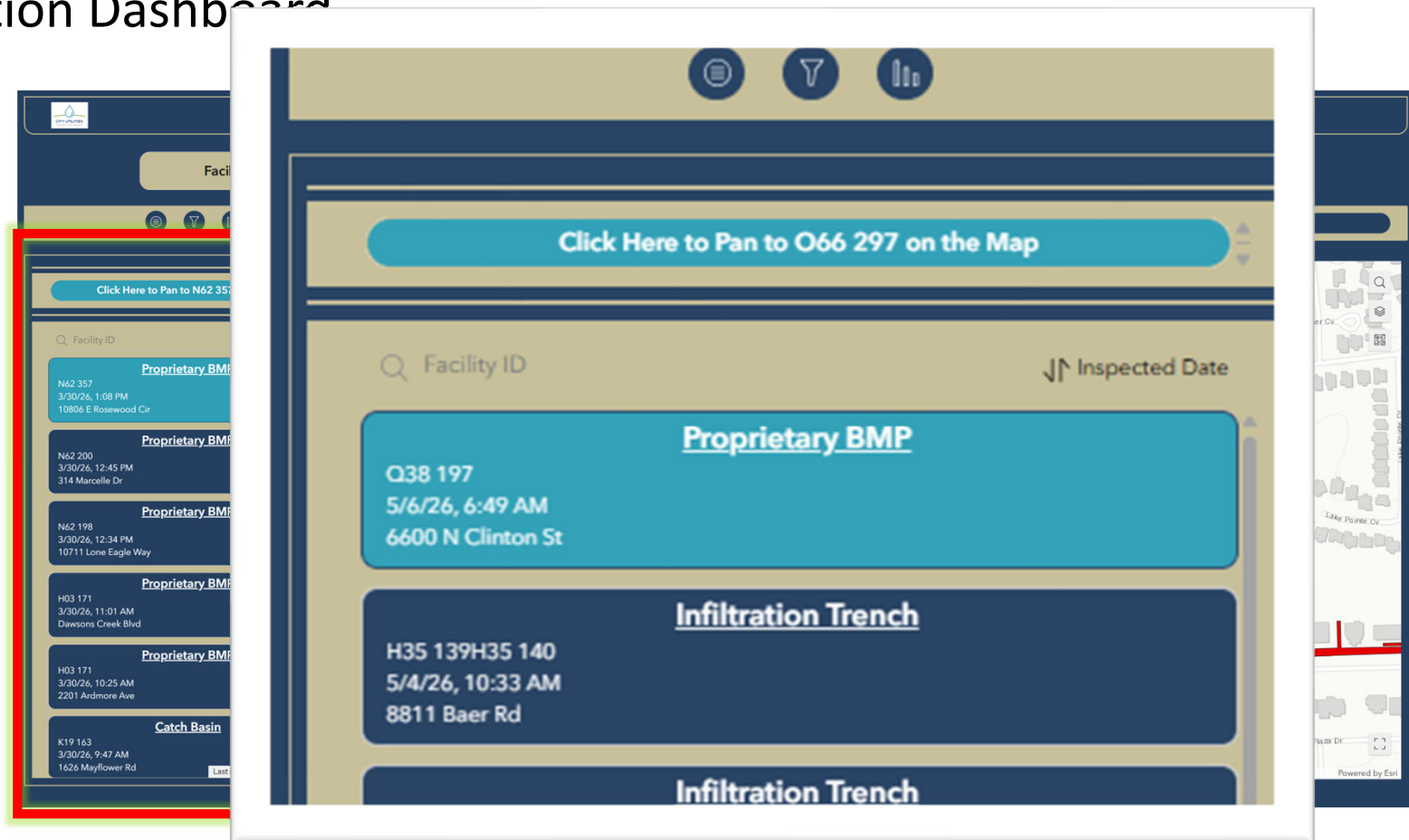
Facility ID	N62 357
Inspection Date	3/30/2026, 1:08 PM
Last Inspection Date	
Property Address	10806 E Rosewood Cir
Property City	Fort Wayne
Property State	IN
Property Zip Code	46845
Inspector Name	Fort Wayne CU
Contact Name	Charlie Cochran
Inspector Address	200 E Berry St
Inspector City	Fort Wayne
Inspector State	IN
Inspector Zip Code	46802
Inspector Phone Number	(260) 427-1062
Inspector Email	charlie.cochran@cityof

Map view showing the location of the inspected facility (N62 357) on a street map. The map displays surrounding streets, buildings, and other facilities. A red dot indicates the location of the inspected facility.

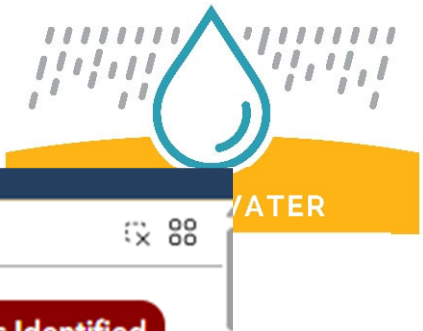
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- BMP Inspection Dashboard



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- BMP Inspection Dashboard

Map View

Potential Problems Identified
Inlet Structure Debris: Yes

Southwest Allen County Schools

Inspection Comments
Planning to jet out primary discharge and evaluate the impacts.

Inspection Requires Further Review
Yes

Inspection Verified
No

Inspection Verified By

Inspection Verified Date
 MM/DD/YYYY

Inspection Review Comments

Follow Up Inspection Required
No

6 242
10/2026, 9:39 AM
5 Mission Dr
mona Lake
590
athwest Allen
county Schools
hlee McHaney
10 Homestead Rd
t Wayne

WATER

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- Not Perfect
- But Improving



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Where are we now?

- Review inspection results
- Follow up with owners identifying problems to educate and initiate maintenance activities
- Following up on outstanding inspections
- Create video demonstration of how to set up apps on the phone.
- Schedule more outreach meetings

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Future Ideas

- Map BMPs while project are under construction
- Record an inspection at Occupancy, or Termination
 - With Owner
 - Use as an educational moment for New Owners to understand.

Questions?



- Charlie Cochran – SWPPP Program Manager
 - 260-427-1062
 - Charlie.Cochran@cityoffortwayne.org
 - stormwater@cityoffortwayne.org



BMP Website
Fort Wayne City Utilities



Fieldmaps: Catching Rain BMP



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Reference the ***Property Owner's Guide to Stormwater BMP Maintenance*** on the City of Fort Wayne Catching Rain website

<https://utilities.cityoffortwayne.org/education/catching-rain/bmp-inspection/>



Property Owner's Guide to Stormwater BMP Maintenance

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Post Construction BMP Program Agenda



Your inspection matters

- Why do we care?
- What is a BMP?
- Standardizing BMP Systems and Types
- Why do we need to inspect?
- Catching Rain BMP application

Storm Water Quantity and Quality



News-Sentinel.(c.2013). /anscontent.news-sentinel.com/?q=gallery/2013/news-sentinel-flood-1913-photos
Flood of 1913:



Great Memories and History of Fort Wayne.(c.a. 2018). In Facebook [Group Page]
retrieved 07, 03, 2023 from <https://www.facebook.com/groups/195279511153069/>
Flood of 1913:



Pemberton Dr. photo courtesy Fire Fighter Album, ACPL
Pemberton Drive 1982

Storm Water Quality



- When stormwater runs off impervious surfaces, such as pavement or roofs, it picks up pollutants like fertilizer, sediment, oil, and bacteria
- This polluted runoff then enters the sewer system, and can end up flowing into our rivers
- This polluted stormwater runoff is one of the biggest threats to clean water and clear rivers



[flows-goes.jpg \(1500x970\) \(mt.gov\)](#)



“Recent” Regional Water Quality Interest



- Maumee River Watershed to Lake Erie



From epa.ohio.gov/divisions-and-offices/surface-water/reports-data/maumee-river-watershed



Composited Western Lake Erie basin true color image derived from the OLCI sensor on Copernicus Sentinel-3a&b obtained from EUMETSAT.

Why do we care?



- What happened?
- How are we adjusting?
- How can we protect?



www.theguardian.com/global-development-professionals-network/2017/jun/02/china-water-dangerous-pollution-greenpeace



www.visitindiana.com/blog/post/picture-perfect-day-chain-o-lakes-state-park/
Chain O' Lakes State Park

Local stormwater implementation plans over the years



- **Municipal Separate Storm Sewer System (MS4)**
 - Conveyance system or systems owned by a state, city, town, village, or other public entity.
 - Discharges into waters of the U.S.
- **City of Fort Wayne is an MS4**
 - Indiana Department of Environmental Management (IDEM) implemented Clean Water Act – 1985
 - City established Stormwater Utility – 1991
 - National Pollution Discharge Elimination System (NPDES) Phase 2 implementation – 2004

How can we protect our water?



- Utilize Best Management Practices (BMPs)
- Definition: Structural and non-structural practices designed to treat stormwater to reduce flooding, erosion, and pollution problems caused by the loss of natural landscape and the increase of roads and buildings and other impervious surfaces that result from land development.
- Goal: Treat stormwater to reduce flooding, erosion, and pollution problems.

Why should you care about BMPs?



- Your money is invested in your BMPs when you built (or bought) your BMP (or facility)
- Organizations are legally responsible for the ongoing operation and maintenance of their BMPs
- They can prevent flooding and erosion of properties
- BMPs prevent the pollution of our rivers and water supply



Your Post Construction BMPs

What are they?



- The goal of Post Construction BMPs is to prevent pollutant discharge by focusing on:
 - Quantity of run-off (flooding / sediment)
 - Quality of run-off (sediment / fuel / nutrients / other)

Post Construction Measures

- After Construction, Long Term Facility Use
- Flood Protection
- Known Pollutants

O&M Manual

- How to Monitor
- How to Maintain

*Post-Construction
SWPPP*

O&M

BMP Manual



Reference the ***Property Owner's Guide to Stormwater BMP Maintenance*** on the City of Fort Wayne Catching Rain website

<https://utilities.cityoffortwayne.org/education/catching-rain/bmp-inspection/>



Property Owner's Guide to Stormwater BMP Maintenance

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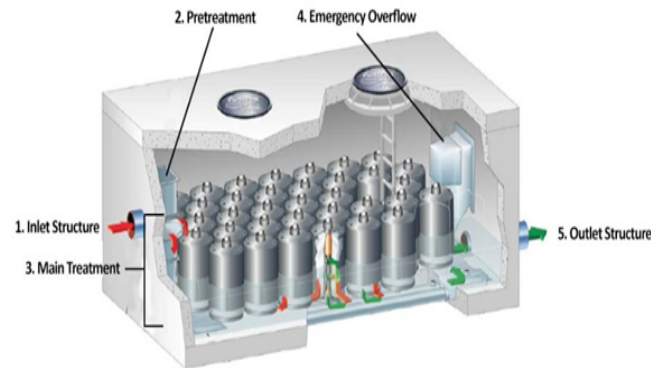
cityoffortwayne.org/utilities

Underground Systems - Proprietary BMP Basics

Proprietary Best Management Practices (BMPs) remove pollutants from stormwater by guiding the runoff through a bed of media like sand, compost, or organic material. These BMPs are “proprietary” because they can be designed to remove specific pollutant(s). They can target suspended solids and particles, or they can aim to remove dissolved pollutants. The details of your proprietary BMP should be provided by the manufacturer. Proprietary BMPs will manage about 1-inch of stormwater and drain quickly after a storm. Proprietary BMPs will be located in stormwater management easements (SMEs), and will be easy to find using the ‘Catching Rain BMP’ app and typing in your property address.

Most proprietary BMPs will have five basic parts. Most of these parts will be underground or contained within a vault. This requires access through a manhole, observation well, or inlet/outlet structure. Because there are different types of proprietary BMPs, inspection and maintenance will require the use of an owner’s manual and specific information from the manufacturer.

1. **Inlet structures** let water flow into the BMP.
2. **Pretreatment** areas remove trash, debris, and dirt from stormwater flowing in. This helps to prevent clogging of the main treatment area.
3. The **main treatment** area is where stormwater is collected, so the water can be cleaned and drain at a controlled speed.
4. **Emergency overflows** let water escape and flow *around* the BMP during intense or long storms, without flooding the surrounding area.
5. The **outlet structure** lets the cleaner water exit the BMP.



What Are My Responsibilities?

Ongoing protection, inspection, and maintenance is important to the function of your BMP. Here are a few things to keep in mind:

- BMPs located on your property according to the ‘Catching Rain BMP’ app must be inspected and cared for by you, the property owner. The requirements for inspection and maintenance presented in this document are supported by the City’s Ordinance in Chapter 53: Stormwater Management Department.
- You can choose to hire others (like a landscape company) to perform inspection and maintenance activities, but you are ultimately responsible for inspection and maintenance.
- City Utilities keeps track of your inspection and maintenance reports and may perform utility-led inspections when they see fit. If you don’t inspect and maintain your BMP, this violates the City’s Stormwater Ordinance and can result in fines, penalties, and requirements to fix your BMP.

Underground Systems - Underground Detention Basics

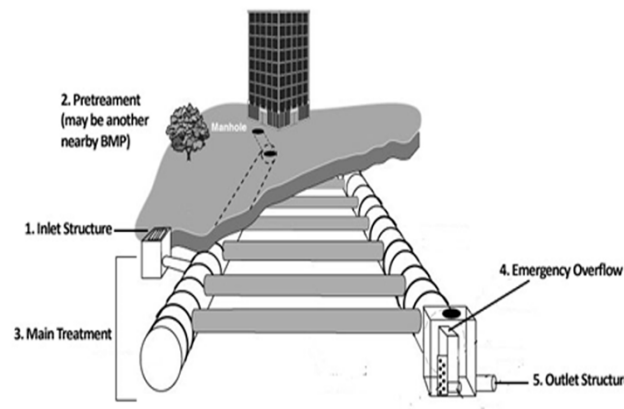


Underground Detention is a Best Management Practice (BMP) made of pipes and vaults that remove pollutants from stormwater by storing it underground for a short amount of time. The BMP lets the sediment (dirt) settle out of the water before it is slowly released. Underground detention is a good BMP to use when space is tight, and are commonly used under parking lots or under grassed areas in common spaces. This BMP is also good for flood control. Underground detention BMPs will manage about 1-inch of stormwater and store water for up to 48 hours. Underground detention BMPs will be located in stormwater management easements (SMEs), and will be easy to find using the 'Catching Rain BMP' app and typing in your property address. Most underground detention BMP will have five basic parts (see the figure below). Most of these parts will be underground or contained within a vault, requiring access through a manhole.

Benefits of Underground Detention

- ▶ Cleans pollutants from stormwater
- ▶ Can be used with other BMPs
- ▶ Good for sites with little space to spare

1. **Inlet structures** let water flow into the BMP.
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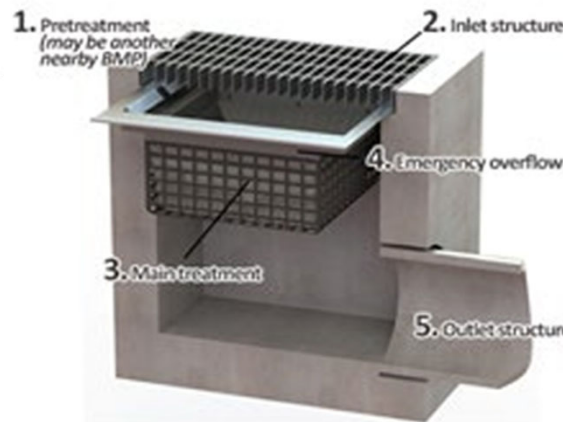
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- City Utilities keeps track of your inspection and maintenance reports and may perform utility-led inspections when they see fit. If you don't inspect and maintain your BMP, this violates the City's Stormwater Ordinance and can result in fines, penalties, and requirements to fix your BMP.

Underground Systems - Catch Basin Basics

Catch Basins are Best Management Practices (BMPs) that remove trash, debris, and sediment from runoff directly at the storm drain. Some catch basins can be built to absorb oils. These catch basins are usually installed underground or in a vault. They are best used in combination with other BMPs because they can reduce pollution before runoff gets downstream. A catch basin can have an insert installed in it to remove pollutants. Some catch basin inserts are designed to remove specific pollutants, like activated carbon, porous polymer, or treated cellulose. The details of your structure should be provided by the manufacturer. Sumped structures will manage about 1-inch of stormwater and drain quickly after a storm. Sumped structures will be located in stormwater management easements (SMEs), and will be easy to find using the 'Catching Rain BMP' app and typing in your property address.

Most sumped structures will have five basic parts (see the figure below). Most of these parts will be underground or contained within a vault. This requires access through a manhole, observation well, or inlet/outlet structure. Because there are different types of sumped structures, inspection and maintenance will require the use of an owner's manual and specific information from the manufacturer.

1. **Inlet structures** let water flow into the BMP.
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5. The **outlet structure** lets the cleaner water exit the BMP.



Benefits of Catch Basins

- ▶ Low cost
- ▶ No additional space required - goes directly in existing storm drain
- ▶ Easy to inspect and maintain
- ▶ Prevent organic and plant debris from entering the storm drain system



What Are My Responsibilities?

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- City Utilities keeps track of your inspection and maintenance reports and may perform utility-led inspections when they see fit. If you don't inspect and maintain your BMP, this violates the City's Stormwater Ordinance and can result in fines, penalties, and requirements to fix your BMP.

Underground Systems - Underground Infiltration Gallery Basics



What Are My Responsibilities?

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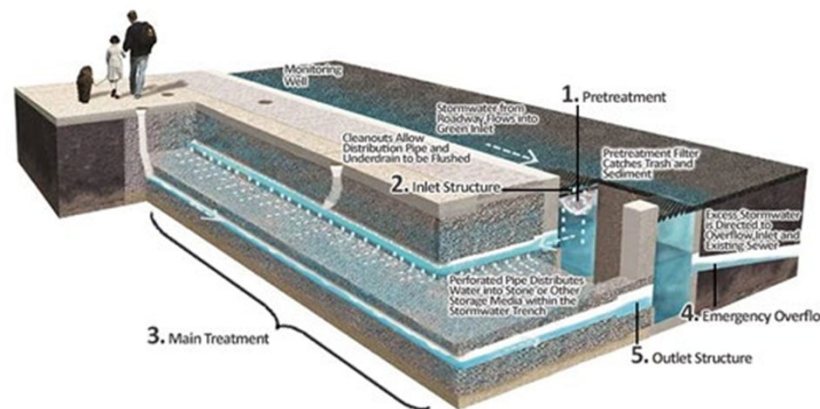
Underground infiltration galleries (UGs) are Best Management Practices (BMPs) that catch and hold stormwater runoff in a structure made of rock, stone, or clay. There, the stormwater soaks into the ground over a couple of days. Infiltration galleries will manage about 1-inch of stormwater and should drain completely about 24 to 48 hours after a storm. Underground infiltration galleries will be located in stormwater management easements (SMEs) and will be easy to find using the 'Catching Rain BMP' app and typing in your property address.

Most underground infiltration galleries will have five basic parts (see the figure below):

Benefits of Underground Infiltration Galleries

- Reduces amount of stormwater runoff
- Removes dirt, trace metals, nutrients, bacteria & organic matter from water
- Allows infiltration upstream which may lower downstream stormwater control costs
- Recharges groundwater supply
- May decrease flooding
- Create an interesting landscape

1. **Pretreatment** areas remove trash, debris, and dirt from stormwater flowing in. This helps to prevent clogging of the main treatment area.
2. **Inlet structures** let water flow into the BMP.
3. The **main treatment** area is where stormwater is collected, so the water can be cleaned and drain at a controlled speed.
4. **Emergency overflows** let water escape and flow around the BMP during intense or long storms, without flooding the surrounding area.
5. The **outlet structure** lets the cleaner water exit the BMP.



Linear Systems - Vegetated Filter Strip Basics

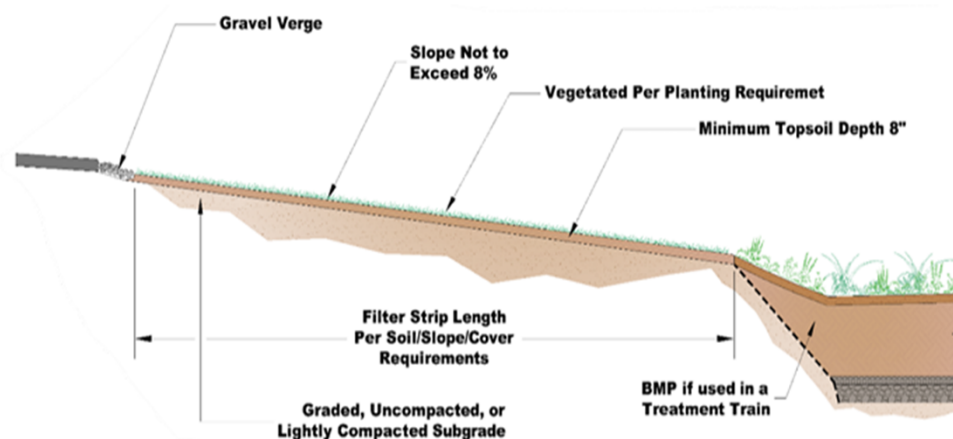
Vegetated Filter Strips are gently sloping Best Management Practices (BMPs) with densely vegetated areas of native plants. They slow down stormwater runoff and filter out pollutants by letting the water soak into the ground. They are usually installed as a pretreatment for another BMP. A vegetated filter strip will manage about 1-inch of about 24 hours after a storm. Vegetated filter strips will be located in stormwater management easements (SMEs), and will be easy to find using the 'Catching Rain BMP' app and typing in your property address.

Most vegetated filter strips will have five common components (see the figure below):

Benefits of Vegetated Filter Strips

- ▶ Can be used as pretreatment for other BMPs
- ▶ Easier to maintain than underground pipes
- ▶ Water is cleaned by soaking into the ground
- ▶ Reduce runoff volume
- ▶ Slow water down, reducing erosion

1. **Inlet structures** let water flow into the BMP.
2. **Pretreatment** areas remove trash, debris, dirt from stormwater flowing in. This helps prevent clogging of the main treatment area.
3. The **main treatment** area is where stormwater is collected, so the water can be cleaned and drain at a controlled speed.
4. **Emergency overflows** let water escape and flow around the BMP during intense or long storms, without flooding the surrounding area.
5. The **outlet structure** lets the cleaner water flow into the next BMP.



What Are My Responsibilities?

Ongoing protection, inspection, and maintenance is important to the function of your BMP. Here are a few things to keep in mind:

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Linear Systems - Infiltration Trench Basics



What Are My Responsibilities?

Ongoing protection, inspection, and maintenance is important to the function of your BMP. Here are a few things to keep in mind:

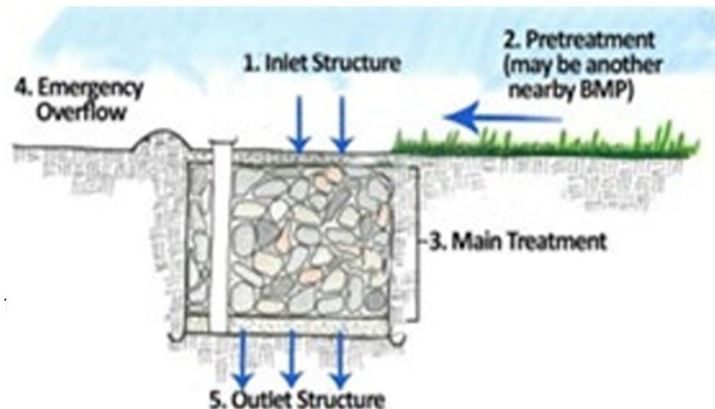
- BMPs located on your property according to the 'Catching Rain BMP' app must be inspected and cared for by you, the property owner. The requirements for inspection and maintenance presented in this document are supported by the City's Ordinance in Chapter 53: Stormwater Management Department.
- You can choose to hire others (like a landscape company) to perform inspection and maintenance activities, but you are ultimately responsible for inspection and maintenance.
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Infiltration Trenches are Best Management Practices (BMPs) that capture stormwater and let it soak into the soil. These trenches are excavated and filled with stone. The stormwater gathers in the trench, flows through the stone, and pollutants are filtered out. Once filtered, the water goes back into the local stream or into the stormwater system. Some infiltration trenches are covered with topsoil and planted with grass. Infiltration trenches will manage about 1-inch of stormwater. They should drain completely about 6 to 72 hours after a storm. Infiltration trenches will be located in stormwater management easements (SMEs), and will be easy to find using the 'Catching Rain BMP' app and typing in your property address. Most infiltration trenches will have five basic parts (see the figure below):

Benefits of Infiltration Trenches

- Reduce stormwater runoff
- Remove dirt, trace metals, nutrients, bacteria & organic matter from water
- Allow infiltration upstream which may lower downstream stormwater control costs
- Recharge groundwater
- Reduce flooding
- They don't use too much space

1. **Inlet structures** let water flow into the BMP.
2. **Pretreatment** areas remove trash, debris, and dirt from stormwater flowing in. This helps to prevent clogging of the main treatment area.
3. The **main treatment** area is where stormwater is collected, so the water can be cleaned and drain at a controlled speed.
4. **Emergency overflows** let water escape and flow around BMP during intense or long storms, without flooding the surrounding area.
5. The **outlet structure** lets the cleaner water exit the BMP.



Linear Systems - Biofilter or Bioswale Basics

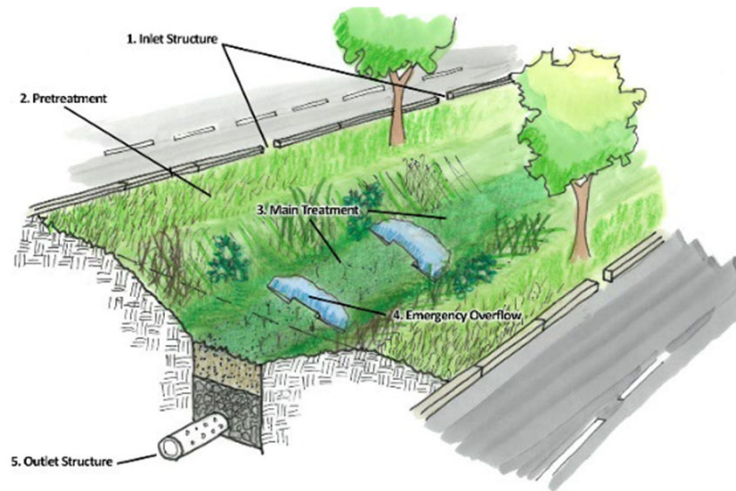


Biofilters or **Bioswales** are Best Management Practices (BMPs) that clean pollutants from stormwater by letting the water soak into the ground. These BMPs are broad and shallow with thick, native grass. The bottom acts as a natural pipe that guides water from a road, parking lot, or other properties. When the water is in the swale, it can soak into the ground and pollutants can filter out. A biofilter or bioswale will manage about 1-inch of stormwater and should drain completely about 24 hours after a storm. Biofilters or bioswales will be located in stormwater management easements (SMEs), and will be easy to find using the 'Catching Rain BMP' app and typing in your property address. Most biofilters or bioswales will have five common components (see the figure below):

Benefits of Biofilters or Bioswales

- ▶ Easier to maintain than underground pipes
- ▶ Water is cleaned by soaking into the ground
- ▶ Reduce runoff
- ▶ Slow water down, reducing erosion
- ▶ Create an interesting landscape

1. **Inlet structures** let water flow into the BMP.
2. **Pretreatment** areas remove trash, debris, and dirt from stormwater flowing in. This helps to prevent clogging of the main treatment area.
3. The **main treatment** area is where stormwater is collected, so the water can be cleaned and drain at a controlled speed.
4. **Emergency overflows** let water escape and flow around the BMP during intense or long storms, without flooding the surrounding area.
5. The **outlet structure** lets the cleaner water exit the BN



What Are My Responsibilities?

Ongoing protection, inspection, and maintenance is important to the function of your BMP. Here are a few things to keep in mind:

- BMPs located on your property according to the 'Catching Rain BMP' app must be inspected and cared for by you, the property owner. The requirements for inspection and maintenance presented in this document are supported by the City's Ordinance in Chapter 53: Stormwater Management Department.
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- City Utilities keeps track of your inspection and maintenance reports and may perform utility-led inspections when they see fit. If you don't inspect and maintain your BMP, this violates the City's Stormwater Ordinance and can result in fines, penalties, and requirements to fix your BMP.

Basin Systems - Bioretention Basics

Bioretention is a Best Management Practice (BMP) that cleans pollution from stormwater. Bioretention areas are built as shallow, sunken areas that catch stormwater from surrounding property. The water soaks into the soil of the bioretention area. A common bioretention area will easily handle rainfall from small storms, and should drain completely 24-48 hours after a storm. Bioretention is a great BMP to be used in median strips, parking lot islands, and landscaped swales. Bioretention areas will be located in stormwater management easements (SMEs), and will be easy to find using the 'Catching Rain BMP' app and typing in your property address.

Most bioretention areas will have five basic parts (see the figure below):

1. **Inlet structures** let water flow into the BMP.
2. **Pretreatment** areas remove trash, debris, and dirt from stormwater flowing in. This helps to prevent clogging of the main treatment area.
3. The **main treatment** area is where s is collected, so the water can be cleaned controlled speed.
4. **Emergency overflows** let water escape BMP during intense or long storms, with
5. The **outlet structure** lets the cleaner water exit the BMP.

Benefits of Bioretention

- ▶ Removes pollutants from stormwater
- ▶ May reduce erosion in nearby streams
- ▶ May decrease flooding
- ▶ Provides habitat for butterflies & birds
- ▶ Creates an interesting landscape



What Are My Responsibilities?

Ongoing protection, inspection, and maintenance is important to the function of your BMP. Here are a few things to keep in mind:

- BMPs located on your property according to the 'Catching Rain BMP' app must be inspected and cared for by you, the property owner. The requirements for inspection and maintenance presented in this document are supported by the City's Ordinance in Chapter 53: Stormwater Management Department.
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Basin Systems - Constructed Wetland Basics



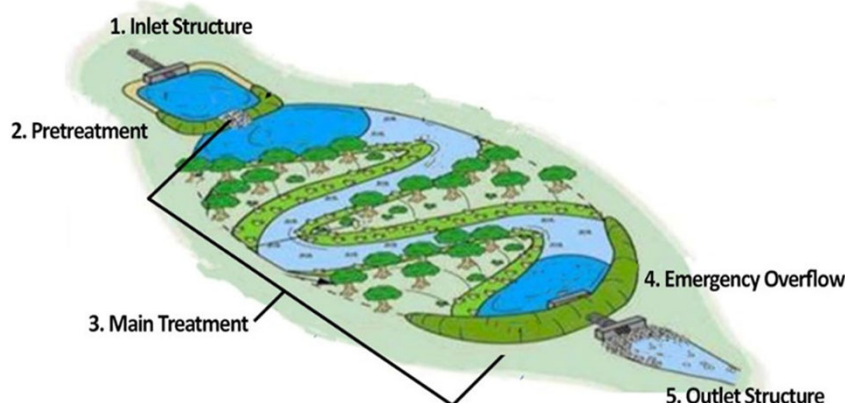
Constructed Wetlands can act as Best Management Practices (BMPs) that catch stormwater runoff and let it go over about 40 hours. Wetlands should be at least 18-inches deep and hold water. Constructed wetlands differ from a wet extended detention basin because it isn't as deep. Plants in the wetland remove pollution from runoff by filtering the water through their roots. Wetlands let the stormwater settle, along with any pollution. This means that polluted water doesn't make it to the storm drain or stream. Constructed wetlands will be located in stormwater management easements (SMEs), and will be easy to find using the 'Catching Rain BMP' app and typing in your property address.

Most constructed wetlands will have five basic parts (see the figure below):

Benefits of Constructed Wetlands

- ▶ Remove pollutants from stormwater
- ▶ Control erosion
- ▶ Recharge groundwater
- ▶ Protect water downstream
- ▶ Provide habitat for butterflies & birds
- ▶ Create an interesting landscape

1. **Inlet structures** let water flow into the BMP.
2. **Pretreatment** areas remove trash, debris, and dirt from stormwater flowing in. This helps to prevent clogging of the main treatment area.
3. The **main treatment** area is where stormwater is collected, so the water can be cleaned and drain at a controlled speed.
4. **Emergency overflows** let water escape and flow around the BMP during intense or long storms, without flooding the surrounding area.
5. The **outlet structure** lets the cleaner water exit



What Are My Responsibilities?

Ongoing protection, inspection, and maintenance is important to the function of your BMP. Here are a few things to keep in mind:

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Basin Systems - Wet Extended Detention Basin Basics

Wet Extended Detention Basins are Best Management Practices (BMPs) that removes pollutants from stormwater by storing it in a basin for a short amount of time. The detention basin lets the sediment (dirt) settle out of the water before it is released. Plants in a wet extended detention basin remove pollutants through their roots and leaves. This BMP is also good for flood control. Wet extended detention basins will have a permanent pool of water. Wet extended detention basins will manage about 1-inch of stormwater and store water for up to 48 hours. Wet extended detention basins will be located in stormwater management easements (SMEs), and will be easy to find using the 'Catching Rain BMP' app and typing in your property address.

Most wet extended detention basins will have five basic parts (see the figure below):

1. **Pretreatment** areas remove trash, debris, and dirt from stormwater flowing in. This helps to prevent clogging of the main treatment area.
2. **Inlet structures** let water flow into the BMP.
3. The **main treatment** area is where stormwater is collected. The water can be cleaned and drain at a controlled speed.
4. **Emergency overflows** let water escape and flow around BMP during intense or long storms, without flooding the surrounding area.
5. The **outlet structure** lets the cleaner water exit the BMP.

Benefits of Wet Extended Detention Basins

- ▶ Cleans pollutants from stormwater
- ▶ Reduces erosion
- ▶ Provides habitat for butterflies & birds
- ▶ Creates an interesting landscape
- ▶ Good for large stream areas



What Are My Responsibilities?

Ongoing protection, inspection, and maintenance is important to the function of your BMP. Here are a few things to keep in mind:

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Basin Systems - Dry Extended Detention Basin Basics

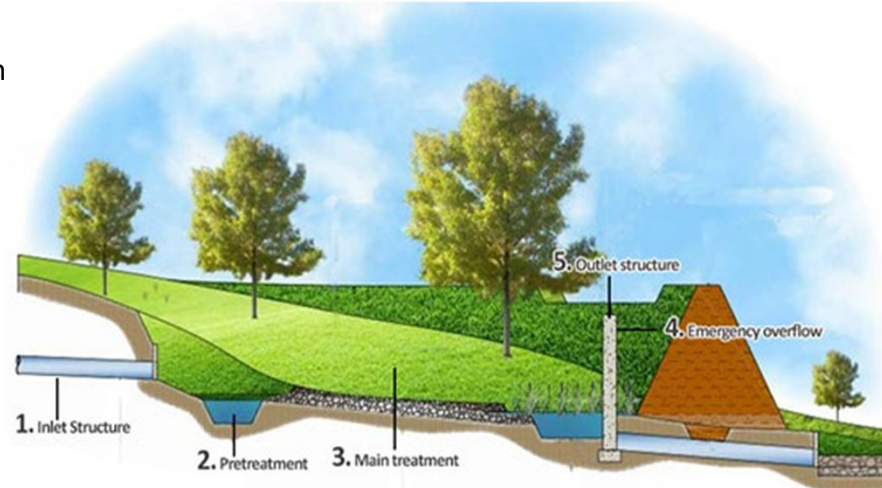


Dry Extended Detention Basins are Best Management Practices (BMPs) that collect and store stormwater. The basins remove pollution and control flooding. A dry extended detention basin will manage about 1-inch of stormwater and drain completely about 40 hours after a storm. Dry extended detention basins will be located in stormwater management easements (SMEs), and will be easy to find using the 'Catching Rain BMP' app and typing in your property address. Most dry extended detention basins will have five basic parts (see the figure below):

Benefits of Dry Extended Detention

- ▶ Easy and inexpensive to use
- ▶ Great at capturing pollutants
- ▶ Reduce erosion
- ▶ Can be used as an area for recreation or open space

1. **Inlet structures** let water flow into the BMP.
2. **Pretreatment** areas remove trash, debris, and dirt from stormwater flowing in. This helps to prevent clogging of the main treatment area.
3. The **main treatment** area is where stormwater is collected, so the water can be cleaned and drain at a controlled speed.
4. **Emergency overflows** let water escape and flow around the BMP during intense or long storms, without flooding the surrounding area.
5. The **outlet structure** lets the cleaner water exit the BMP.



What Are My Responsibilities?

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Basin Systems - Surface Bed Filter Basics

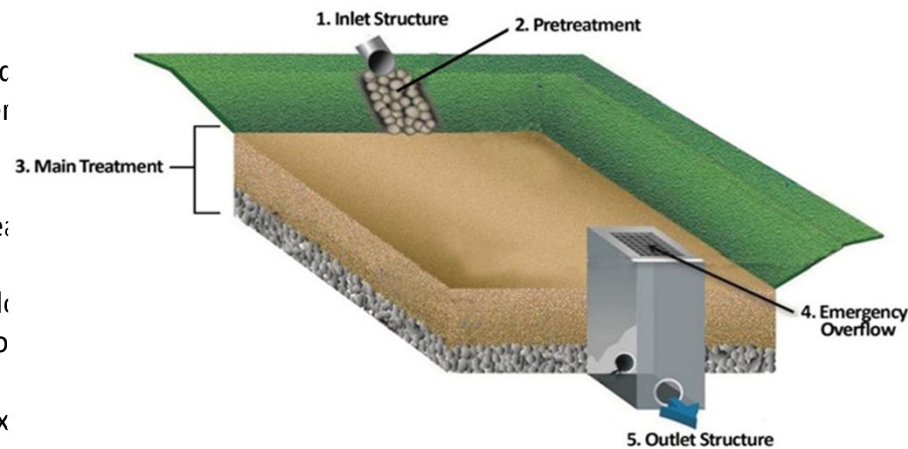
Surface Bed Filters are Best Management Practices (BMPs) that clean stormwater by filtering it through a sand bed. Runoff is guided into a bed of sand where it is collected and cleaned. The water is collected, filtered through the sand where it is cleaned, and released to a stream or stormwater system. There are three types of surface bed filters; 1) Underground sand filters that use several chambers, 2) sand filters installed on the edge of an impervious surface, like a parking lot, and 3) pocket sand filters used specifically for small site projects (for these, stormwater is pretreated by a sediment basin or filter strip before entering a pocket sand filter). Surface bed filters will manage about 1-inch of stormwater and drain 1 to 2 days after a storm. Surface bed filters will be located in stormwater management easements (SMEs), and will be easy to find using the 'Catching Rain BMP' app and typing in your property address.

Most surface bed filters will have five basic parts (see the figure below):

1. **Inlet structures** let water flow into the BMP.
2. **Pretreatment** areas remove trash, debris, and from stormwater flowing in. This helps to prevent clogging of the main treatment area.
3. The **main treatment** area is where stormwater is collected, so the water can be cleaned and drain at a controlled speed.
4. **Emergency overflows** let water escape and flow from the BMP during intense or long storms, without flooding surrounding area.
5. The **outlet structure** lets the cleaner water exit the BMP.

Benefits of Surface Bed Filters

- ▶ Reduce pollution in stormwater runoff
- ▶ Let some stormwater soak into the ground
- ▶ Reduce stormwater runoff
- ▶ A good option for steep slopes



What Are My Responsibilities?

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Pavement Systems - Permeable Pavement Basics

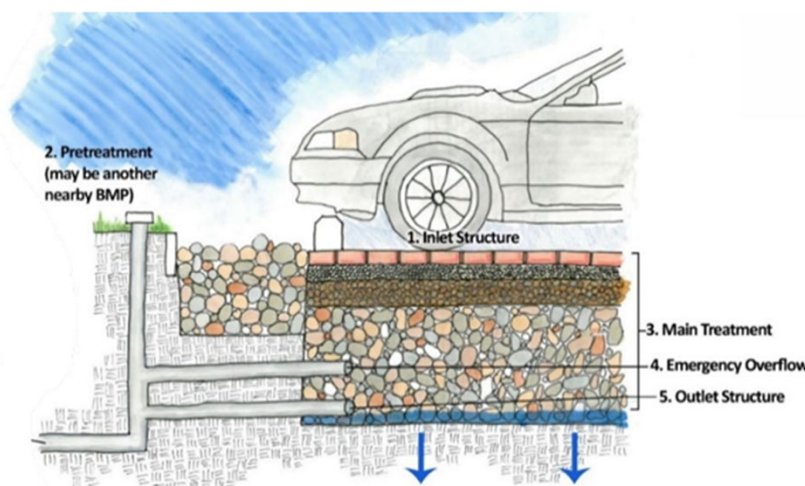


Permeable Surfaces are Best Management Practices (BMPs) that let stormwater flow into the holes in the pavement surface. From there, the water soaks into the soil below. Permeable surfaces can consist of modular pavers, concrete grids, pervious concrete, porous asphalt, and cellular confinement systems. Permeable surfaces usually manage about 1-inch of stormwater. The permeable surface should be dry about 2 hours after a storm. Permeable surface areas will be located in stormwater management easements (SMEs), and will be easy to find using the 'Catching Rain BMP' app and typing in your property address. Most permeable surfaces will have five basic parts (see the figure below):

Benefits of Permeable Pavement

- ▶ Reduces and cleans stormwater runoff
- ▶ Recharges groundwater
- ▶ Can use in cold climates, even below freezing, which can reduce black ice
- ▶ Lasts longer than traditional pavement by reducing effects of freeze-thaw cycles
- ▶ Better traction when wet
- ▶ Reduces spray from moving vehicles and roadway noise

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3. The **main treatment** area is where stormwater is collected, so the water can be cleaned and drain at a controlled speed.
4. **Emergency overflows** let water escape and flow around the BMP during intense or long storms, without flooding the surrounding area.
5. The **outlet structure** lets the cleaner water exit the BMP.



What Are My Responsibilities?

Ongoing protection, inspection, and maintenance is important to the function of your BMP. Here are a few things to keep in mind:

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BMPs on your property



What are Your Responsibilities Once Your BMP is Located?

Owner:

- Protect your BMP and related components from development, encroachment, and damage
- Maintain and protect access routes, so your BMP is accessible from a public roadway
- At a minimum, conduct and document inspections and maintenance annually
- Follow guidelines in the BMP inspection forms found in Section 5 of the BMP manual
- Submit required information to the City via the 'Catching Rain BMP' app
 - App explained in further detail in later slides

Utility:

We are here to help - contact City Utilities with questions about your BMP

- stormwater@cityoffortwayne.org
- Phone: 311 or (260) 427-8311

BMPs on your property *(cont.)*



Can You Make Changes to the BMP on Your Property?

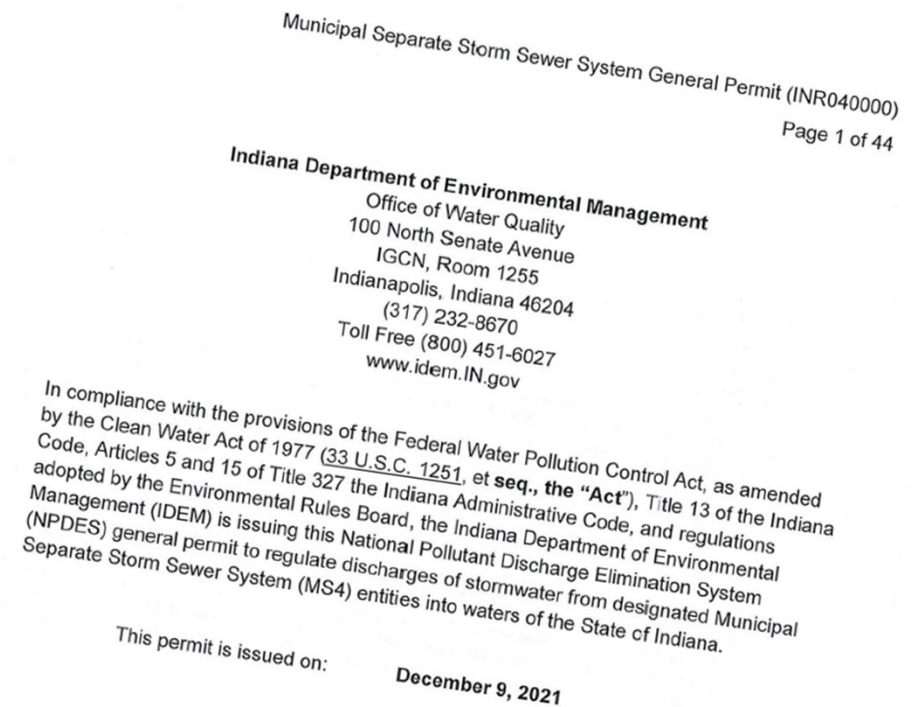
- You **CAN** make changes to the “look” of your BMP within the requirements and guidance provided in Section 5 of the Manual.
- You **CANNOT** make any changes to your stormwater BMP that will degrade or alter its functionality.



Fort Wayne's Plan for Stormwater Measures / BMPs



- Improve Implementation of Construction / Effectiveness of Plans
- Improve BMP's Useful Life
- Improve Review and Reporting
 - IDEM MS4GP requires all Post Construction BMPs to be inspected
 - Fort Wayne's BMP Inspection Program will require all BMP Owners to perform annual inspections of their BMPs



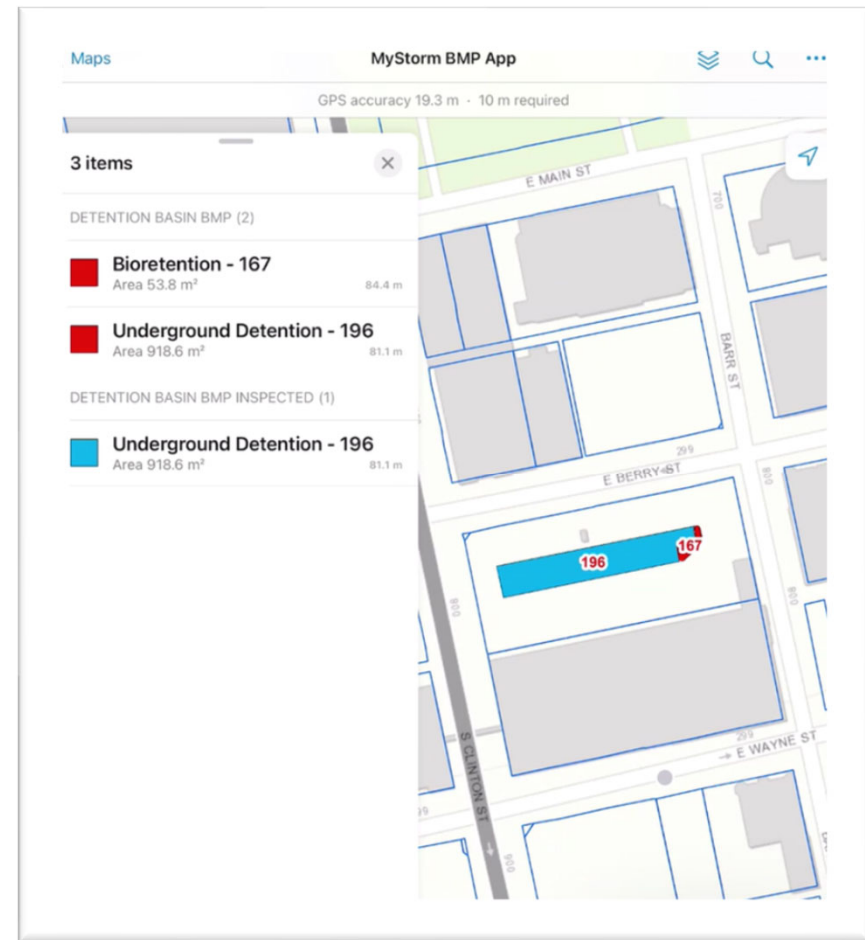
Administering Inspection “Catching Rain BMP” app



- Allows users to inspect their assets
- Mobile devices with Cellular / Wifi connection
- Utilizes “ArcGIS Field Maps” and “ArcGIS Survey 123”



Catching Rain BMP app



Downloading the “Catching Rain BMP” Tool



1. Open the app store on your mobile device.
2. Search for the below 2 apps, download and install both.

a. ArcGIS Field Maps



a. ArcGIS Survey 123



Catching Rain BMP app

How to Use “Catching Rain BMP” Tools *(cont.)*



1. Scan the QR Code with your phone camera to open the Catching Rain BMP app.
2. If you are taken to a login screen, Click → Skip Sign In.
3. Your screen will open to a default map.
4. Click the arrow icon  within the app, and the map will move to your current location.
5. You can also click the search icon  and enter your address to see that specific property



Catching Rain BMP app

Note: if you can't see a BMP on your property, try zooming out on the map! Larger sites may have BMPs that are spread out, or have multiple BMPs

How to Use “Catching Rain BMP” Tool *(cont.)*

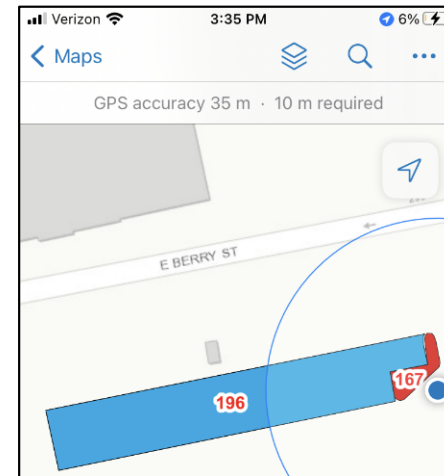


CHOOSE A BMP

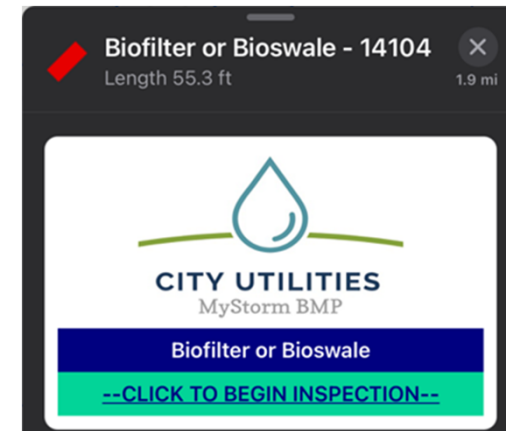
1. **RED** = needs inspected
2. **BLUE** = inspection has been submitted
3. Click on a BMP on the map that you want to inspect.

Note: You may have more than one BMP on your property.

4. Select **“CLICK TO BEGIN INSPECTION”**
 - a. This will open Survey123.



Example of Two BMPs on Property



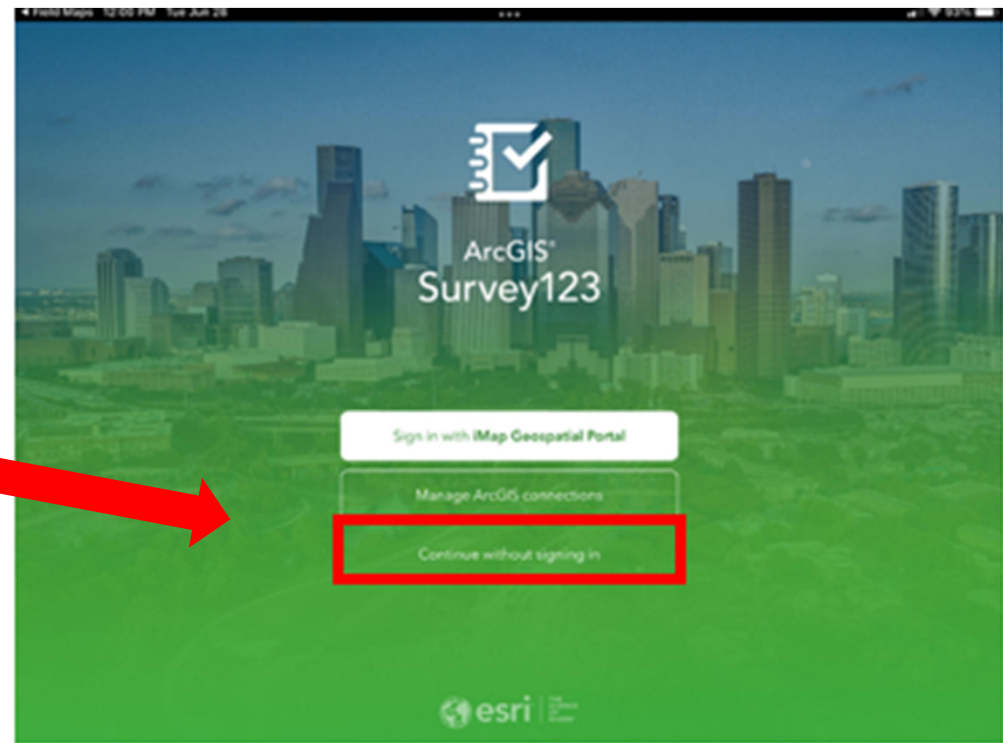
Example of Selected BMP

How to Use “Catching Rain BMP” Tool *(cont.)*



BMP INSPECTION

1. Once the link is clicked, it will launch the Survey123 app.
2. Click “*Continue without Signing In*”.



Survey123 Opening Screen

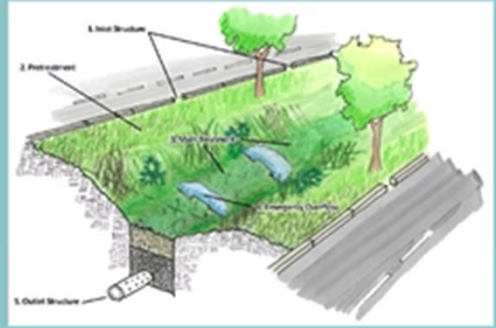
Recording an Inspection



- Brief instructions are on the top of the page.
- Enter the date of the inspection



All items listed must be inspected unless not applicable (NA). Answering "Yes" indicates a need for maintenance. Please include an approximate repair date for items that require maintenance. The maintenance and inspection frequency shall be done in accordance with the BMP Maintenance Agreement for Stormwater Facilities. This app details these frequency periods, and submittal of the inspection (once per year) is a certification that you have met these requirements. This inspection shall be done once every five years by a PE, PLA, or other qualified professional.



* Required Fields - (must be completed before inspection can be submitted)

BMP Info		
BMP ID	Today's Date:	Date of Last Inspection:
12100	 Monday, March 13, 2023  10:33 PM	 Date  Time

Recording an Inspection (cont.)



- Enter the address of the property
- Enter who's inspecting the BMP
- Enter who owns the BMP

Property Info

Property Address: *

Who Is Inspecting the BMP?

Name (Owner, Tenant, Property Manager or Landscape Company): *

Contact Name (If Different):

Inspector Address *

Phone #: * () -

Email: *

License Type: v

License #: *

Who Owns the BMP?

Check Here if Same as Inspector

☐ Yes

Name (Person(s) or Company): *

Contact Name (If Different):

Owner Address *

Phone #: * () -

Email: *

Recording an Inspection (cont.)



- Fill out Pretreatment and Main Treatment components

NOTICE

- If you answer “YES”
- Something may need addressed

Pretreatment & Main Treatment (Components 2 & 3)	
1. Is the swale hard to access for inspection and maintenance? *	Comments:
☐ Yes ☐ No ☐ Not Applicable	
Guidance: Any obstacles blocking access and/or maintenance should be removed. If access is blocked by a permanent fixture (e.g., fence), note this in the inspection. Schedule: Monthly	
2. Is the swale holding water for longer than it was designed (typically 24 hours after a storm)? *	Comments:
☐ Yes ☐ No ☐ Not Applicable	
Guidance: Water should drain out of the swale per its design, which is usually about 24 hours after any rain event. If it stays in the swale longer, native vegetation could be killed, or wetland plants could begin to grow. Check for and remove any blockages from the swale. If no blockages are found and standing water is common during dry periods, more extensive maintenance, such as regrading or repair of the underdrain, may be required. Schedule: Monthly	
3. Is there sediment, bare soil, eroding areas in the swale or pretreatment area? Is there any unhealthy vegetation? *	Comments:
4. Notice another problem? Please describe your comments.	
Eroded and bare areas should be repaired and cover the cause of the erosion issues, check dams may be removed from the pretreatment structure(s) and any f	
Schedule: Monthly. Annual sediment removal.	

Recording an Inspection (cont.)



- Fill out Inlet Structure & Emergency Overflow Components



Inlet Structure & Emergency Overflow (Components 1 & 4)	
5. Do the inlets or emergency overflow components of the swale show evidence of erosion, bare spots, or scour? * ☐ Yes ☐ No ☐ Not Applicable	Comments:
Guidance: Inlet structures should have stable soils covered by dense, healthy vegetation and/or a stabilizing material (e.g., rock, concrete, asphalt, or paver lining) to prevent erosion. Bare soil or signs of erosion should NOT be present. Repair eroded areas and stabilize bare soil immediately with the appropriate vegetation or material cover. At the emergency overflow location, install a rock lining that extends at least 5 feet beyond the area of erosion. Consult an experienced professional if you have questions on the size and type of rock. Schedule: Monthly	
6. Do the inlet or emergency overflow contain trash, sediment, debris, grass clippings or other materials that can obstruct stormwater flow? * ☐ Yes ☐ No ☐ Not Applicable	Comments:
Guidance: Remove unwanted materials and correct any other problems that block the water flow into or out of the swale or damage the vegetation. Schedule: Monthly	
7. Is there visual evidence of pollutants in the swale (e.g., oil sheen odd discoloration, stains, etc.)? * ☐ Yes ☐ No	Comments:
8. Notice another problem? Please describe your comments.	
8. Notice another problem? Please describe your comments.	

Recording an Inspection (cont.)



- Fill General Inspection Comments
- Add photos if necessary
- Click checkmark to submit Inspection.



General Inspection Comments

Use this section for any notes, comments, or questions generated by your inspection. If you are using this section to continue your notes from a previous section, please include the section name and section number. You may also use this field to address issues not covered in this app.

General Inspection Comments

Photos

BMP Photos (Max Photo Count: 5)

City Utilities Contact Information

Note: Completed inspections must be submitted through the MyStorm BMP app. Questions? Contact Fort Wayne City Utilities (Email: stormwater@cityoffortwayne.org, Phone: (260) 427-8311)

--- Click Checkmark Below to Submit Completed Inspection ---

✓

Inspection App monitoring



- Fort Wayne will review inspections
 - Red flags will alert us on problems that may need to be looked into
 - We will follow up with BMP Owners if inspections are not completed

BMP Success Factors



- There are 4 BMP success factors to look out for while performing inspections
 - Vegetation
 - Two-day drain time
 - Protection
 - Cleanliness
- These 4 success factors are important to keeping your BMP functioning as it was designed to
- These can be used as “performance goals” when inspecting your BMPs

Vegetation



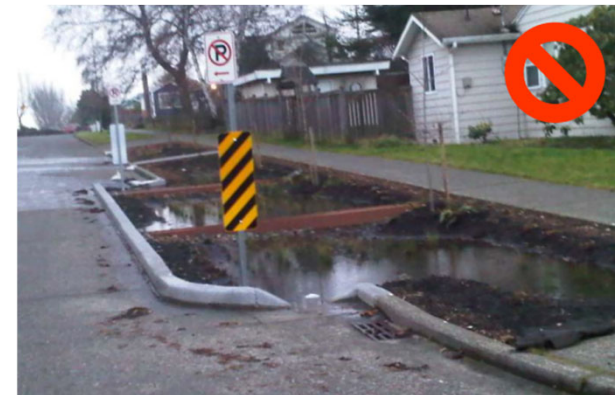
- Vegetation, if present, should be healthy and maintained
- There should be no bare soil present
- Vegetation should not be overgrown or excessively weedy



Two-day Drain Time



- Most BMPs should completely drain stormwater within 48 hours
- Longer drain times can occur during periods of extended or frequent rains
- Repeated instances of standing water can indicate clogs or other problems within your BMP



Protection



- BMPs must be protected from damage that could occur due to pedestrians, vehicles, heavy equipment, and animals
- BMPs cannot be used as storage for vehicles, heavy equipment, waste, dirt, or mulch



Cleanliness



- The area around a BMP should be kept clean
- There should be no sediment, litter, or stored pollutants in the BMP or its drainage area



What maintenance is needed between inspections?



Grass has grown over this inlet and should be cut back to allow water to enter the inlet.



Debris and leaf litter are blocking this inlet. Remove this material to allow water to enter the inlet.

What maintenance is needed between inspections? *(cont)*



Please Note: These inspections are a collaboration between City Utilities and YOU. Please don't hesitate to reach out if you have any questions or need any guidance maintaining your BMP.



This pretreatment area is full of sediment that should be removed. Look for a source, like an eroded area. Larger jobs may require a contractor and/or special equipment.

What maintenance is needed between inspections? *(cont)*

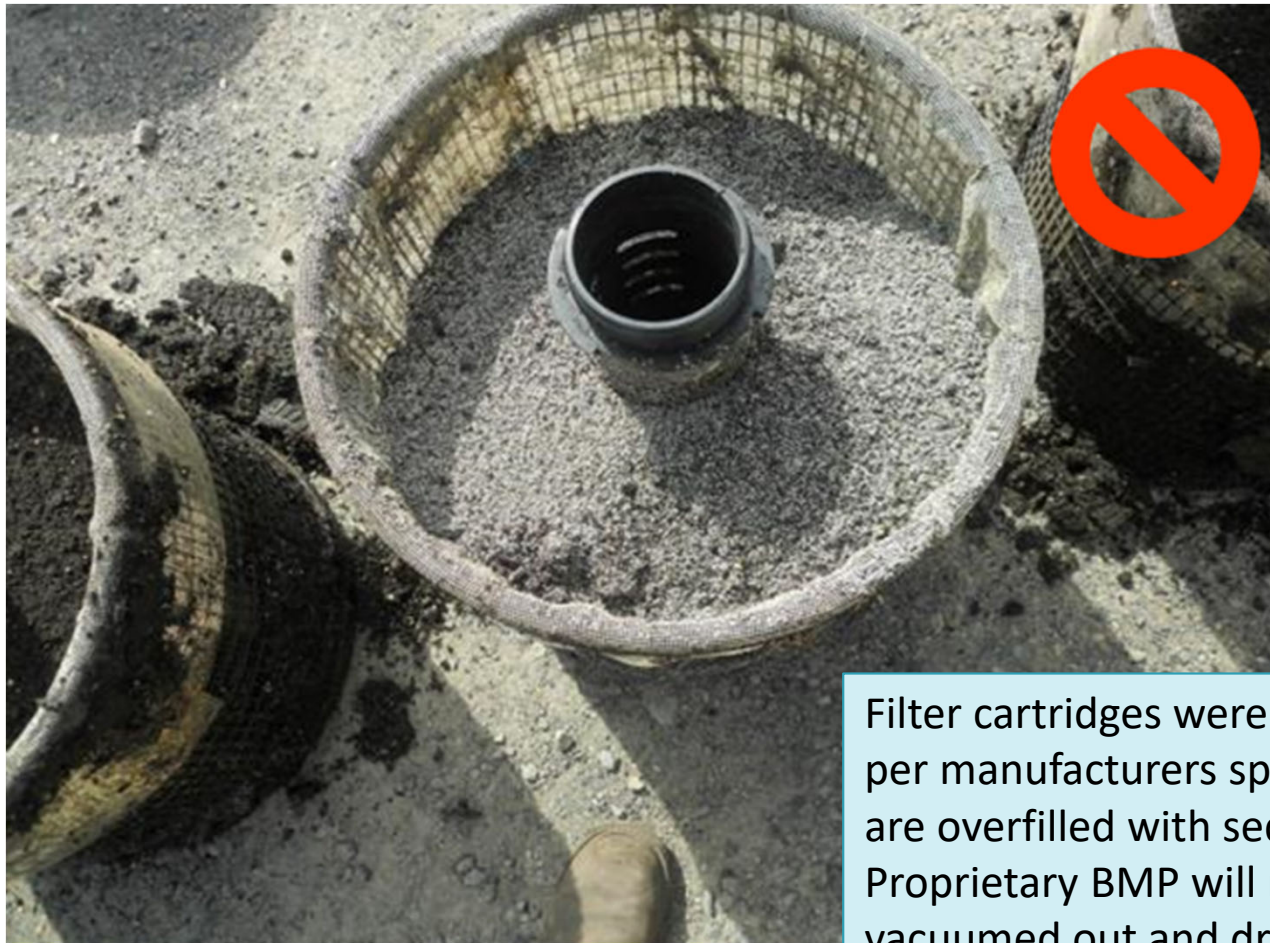


Overgrown vegetation, especially invasive plants like cattails, should be removed and replaced with the correct plantings. Larger jobs may require a contractor and/or special equipment.



Erosion is present in the pretreatment area to this bioswale. New vegetation, additional soil, and/or other measures should be installed.

Practice: What maintenance is needed?



Filter cartridges were not replaced per manufacturers specifications and are overfilled with sediment. Entire Proprietary BMP will need to be vacuumed out and dried, and filter will need replaced.

Inspecting your stormwater BMP annually



INSPECTION TYPE	INSPECTION GUIDANCE	DOCUMENTATION PROCEDURES
Routine Operational Inspections	▶ Often, and generally when landscaping activities are being performed at the property and after storms and snowmelt events	▶ Documentation of these inspections is not required; however, it is a good idea to document larger-scale maintenance activities to keep track of what has been done and the costs (keep receipts if possible)
Regulatory-Required Formal Inspections	▶ Submit annually by October 1st each year ▶ Performed by the owner (or individual designated by the owner) who is familiar with the purpose and basic function of the BMP ▶ Once every five years, the inspection needs to be conducted by either a PE, PLA, or other qualified professional	▶ Must use the BMP Guidance Sheets and BMP Inspection Forms associated with your type of BMP (located in Section 5 of this Manual and on the 'Catching Rain BMP' app) ▶ The completed inspection forms and indication of maintenance performed must be submitted via the 'Catching Rain BMP' app by October 1st each year