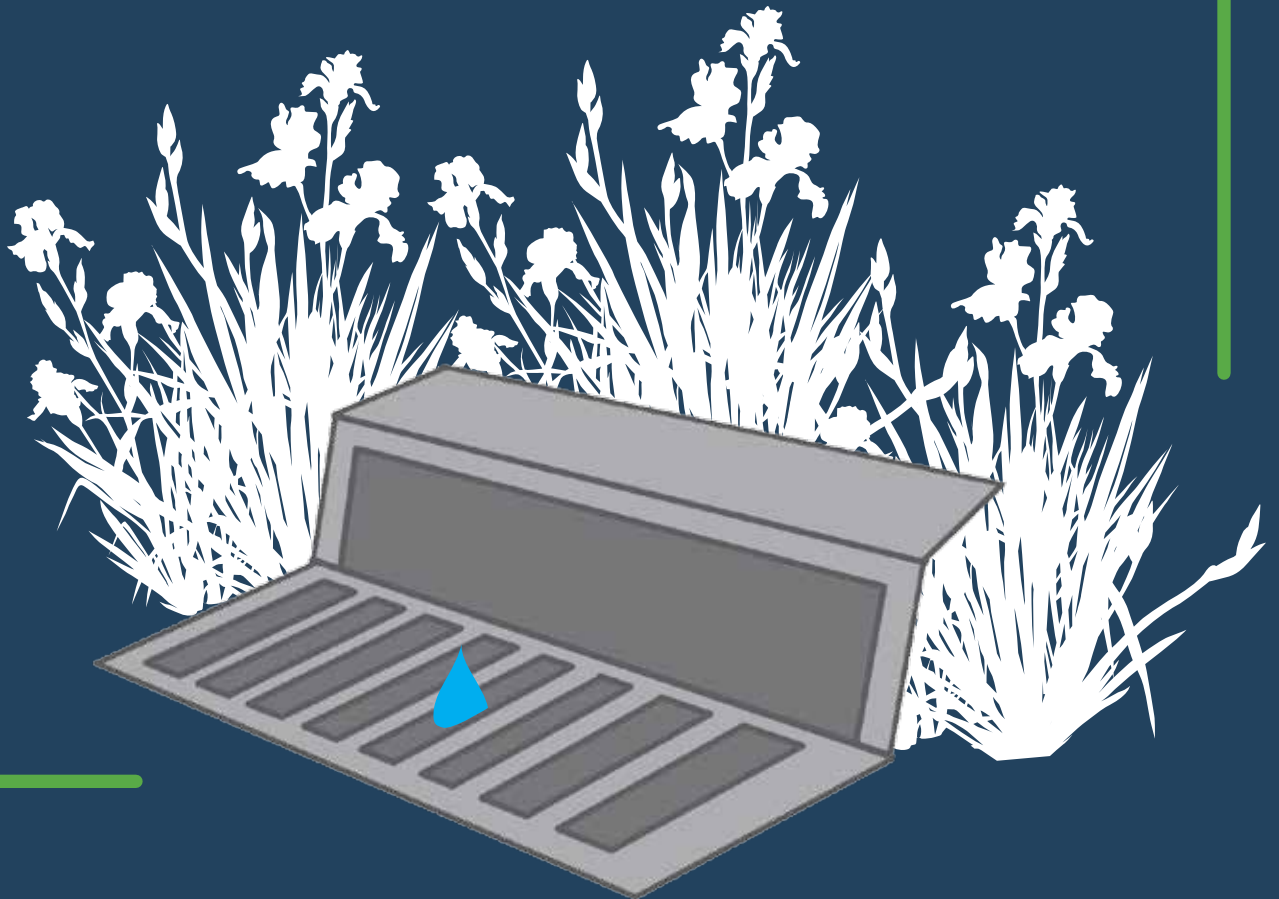


YOUR STORMWATER LANDSCAPE

An introduction on the purpose and care of
stormwater-related installations for Homeowners
Associations and their maintenance providers



The White River Alliance
1052 Woodlawn Avenue
Indianapolis, IN 46203
thewhiteriveralliance.org

In partnership with
Carmel • Cicero • Fishers • Hamilton County • McCordsville
Noblesville • Pendleton • Westfield • Zionsville

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CONTRIBUTORS

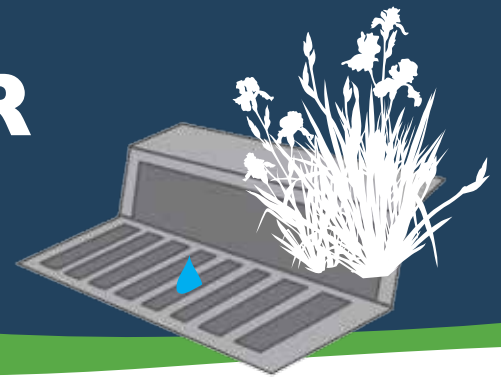
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YOUR STORMWATER LANDSCAPE



Homeowners Associations and Stormwater Infrastructure

One of the responsibilities of a homeowners association (HOA) is to maintain the common areas and green space within their neighborhood. These areas may include stormwater retention ponds, rain gardens, bioswales and/or other features often referred to as best management practices (BMPs). These features serve a critical function for the proper management of stormwater, including both quantity and quality aspects of stormwater management.

Sometimes the HOA owns and/or is also responsible for the maintenance for the stormwater inlets, pipes, drains and other parts of the storm drainage system within the neighborhood boundaries. These systems are often referred to as gray infrastructure. Maintenance responsibilities for these systems vary depending on the ordinance and/or policy of the county, city or town with jurisdiction.

In most communities the storm sewers, including pipes and structures, that are installed in new residential subdivisions and in the public right-of-way are owned and maintained by the local government entity. The water quality BMPs, including both detention ponds and mechanical water quality units, are typically privately owned and, therefore, the responsibility of the HOA or owner of the property on which the practice is located although this can vary. In commercial developments, typically all storm sewer infrastructure and BMPs are privately owned and maintained, though this too may vary by jurisdiction. For newer developments, there is often a BMP Operation and Maintenance (O&M) Manual that is developed during the project approval that stipulates how and when practices are to be maintained.

Why You Should Care

Stormwater runoff has a negative impact on water quality and quantity. You pay for those impacts, as do your neighbors, downstream communities, wildlife, and others. Impacts to water quality affect the cost to clean the water we use in our homes, the safety of water recreation, and the overall health of the ecosystem. Stormwater features also protect against flooding by impounding water and releasing it slowly into waterways. If these features do not function properly, communities are at risk.

This manual will help property owners identify the stormwater features under their management, understand general maintenance requirements, and learn next steps. Your local officials are available to answer questions, and their contact information can be found at the end of this manual.



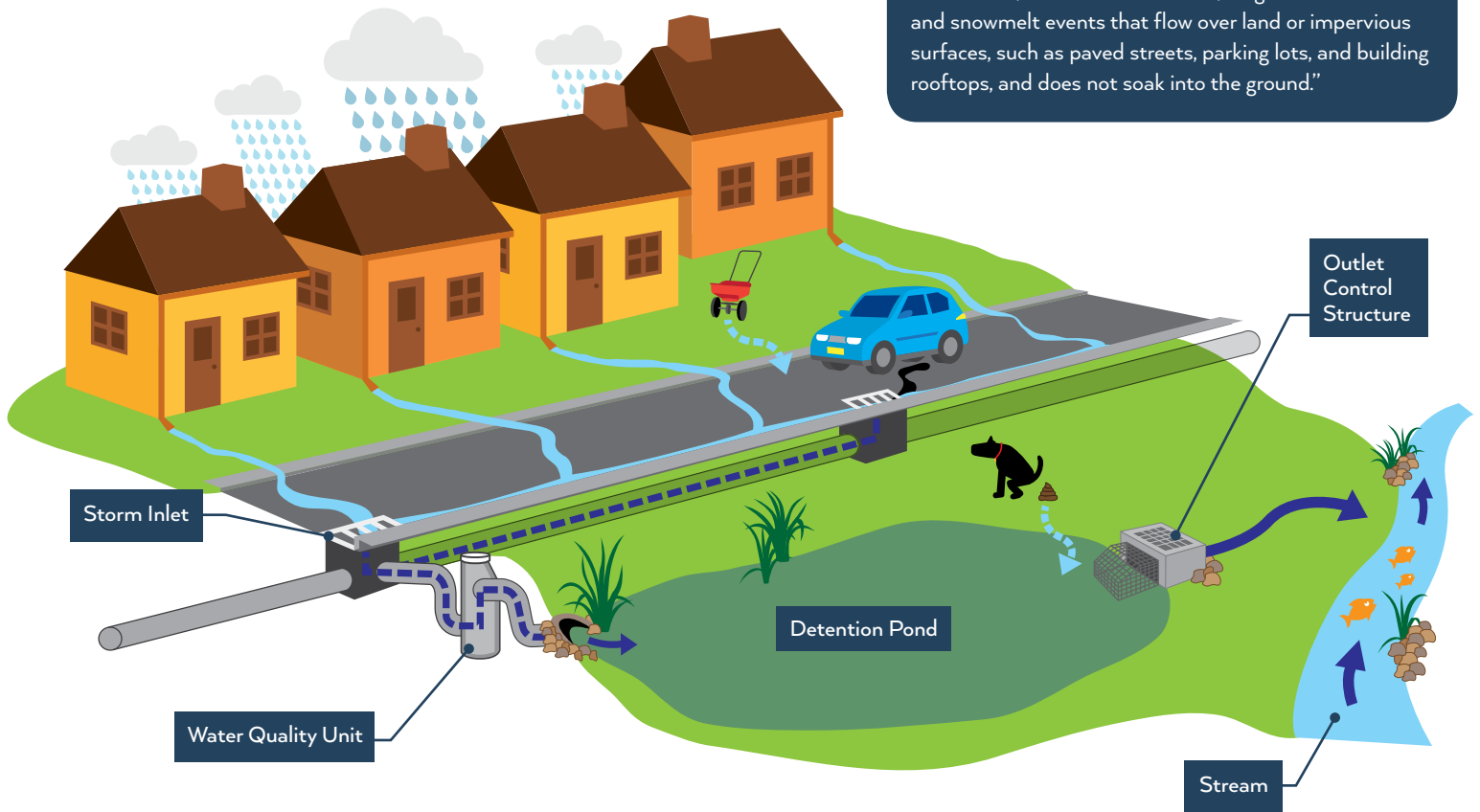
A buffer around a wet pond helps reduce pollution from entering the stormwater system and our waterways

THE BASICS



What is Stormwater:

According to the Environmental Protection Agency, stormwater, or stormwater runoff, is “generated from rain and snowmelt events that flow over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground.”



How It All Works

Before development changed our landscapes, rain would fall on forests, prairies, wetlands and other natural areas that could soak up and hold onto all that water. Now that our communities are covered in roofs, roads, and other hard surfaces, this same stormwater presents challenges for flood and pollution prevention. Most modern communities have a stormwater infrastructure system that resembles the one above. Here, the rain that falls on our houses and roads - even our lawns, which are poor at soaking up the rain - runs into storm drains. From the drains, the water may or may not pass through a mechanical water quality unit before arriving at a detention pond. The detention pond allows some solid materials collected as the stormwater ran into the drains to

settle out of the water while also holding back a large volume of the runoff in order to prevent floods. The water in these detention ponds slowly flows out into a receiving stream. Some systems may include a forebay (small basin where the water comes in) that plays a similar role as a mechanical unit but is above ground.

Finally, some systems also include green infrastructure elements like rain gardens or infiltration trenches. These practices help soak more water into the ground while also removing pollutants. More information about these and other practices follows.



What They Are

Wet ponds are depressions in the ground designed to store water to prevent neighborhood flooding and also to filter water before it is released to a major waterway such as a river, lake, legal wetland, or reservoir. Local governments require that rain water be stored and treated by ponds or other practices to meet Federal and State laws. These ponds (and forebays, if present) need to be maintained in good working order to stay in compliance with these laws.

Your Responsibilities

1. Stabilization/Erosion Correction (bare spots)
 - Shoreline and Bank Erosion Stabilization
 - Animal Burrow Filling and Animal Trapping/Relocation
2. Vegetation Control
 - Invasive Aquatic Plant Removal
 - Bank Vegetation Removal
 - Native Plant Zone Trimming and Maintenance
3. Nuisance Algae Management and Control
4. Tree/Woody Vegetation Removal
 - Trees
 - Brush
5. Trash Collection/Removal
6. Dredging and Sediment or Muck Removal
 - Sediment
 - Muck/Biomass

Key Considerations

- In general, keep a big picture perspective, but don't let minor issues get out of control (i.e. inspect your ponds yearly).
- Many issues with bare spots (erosion) can be corrected by hand/shovel application methods with spreading of topsoil, seed, and straw or erosion control blanket.
- Consider installing native aquatic plants on the entire safety shelf of the pond to decrease shoreline erosion and decrease algae production. These plants will consume phosphorous and nitrogen which are contributors to algae production.
- Install an aeration device in the pond to help with oxygenation which can contribute to good water quality.
- Vegetation maintenance of invasive species should include complete removal. Chemical treatment options should be followed by dead plant removal.
- Consider using beneficial bacteria to reduce organic sludge (muck) from the pond. This may decrease the overall amount of dredging required.
- Be aware that there are several types of dredging options including traditional excavation, hydraulic dredging, and VAC truck pumping systems. Obtain several quotes and select the price/option that best fits your needs.
- If you have an intentional, planned native plant zone in or around your pond, hire an experienced professional to manage/maintain this area.



A typical wet pond and outlet control structure



A wet pond vegetated with native plants to improve water quality



What They Are

Dry Ponds are temporary storage areas for stormwater. Depending on design purpose, they should hold little to no water during dry periods but should be expected to hold water for a day or two after the last rain.

Vegetation in dry ponds can consist of managed turf grass. Preferably, they will be naturalized with native plants/grasses and protected from mowing and chemical spray. In some communities, naturalization may be required. Native vegetation areas should have signage placed around them for identification and protection. Dry detention areas can have small channels for conveying low flows that can be lined with concrete, turf, or planted with native vegetation. Some low flow channels in dry detention basins may double as infiltration areas where rain can soak into the ground.



A dry pond with some naturalized vegetation

Your Responsibilities

1. The outlet structure or pipe, where the water drains out of the pond, should be inspected and cleared of any blockages.
2. If vegetation is creating a blockage, then it should be cleared as well.
3. Undesired vegetation not specifically approved by the construction plan should be physically removed on a monthly basis or spot treated with an approved herbicide by a qualified individual.
4. Native planting areas should be mowed or cut once per year in the early spring or late fall. Cutting in late fall will promote more flowering plants. All cuttings should be removed from the pond area and properly disposed. Lawn clippings and leaves should not be placed in the basins.
5. Any bare spots should be repaired and re-vegetated with topsoil, proper seed, and erosion control blanket at a minimum.
6. Excess soil mounding, standing water, undesired vegetation or other obstructions, and/or low spots should be corrected by restoring the original shape and depth of the basin.
7. Trash collection/removal

Key Considerations

1. Improvements such as swing sets, trails, paths, athletic fields, etc. should not be placed within these ponds without proper government approvals. If improvements are allowed, they should not impede the free flow of water.
2. Fertilizers and pesticides should not be used within the basin unless absolutely necessary and only by a licensed professional that has been made aware that this is a stormwater structure.



What They Are

Gray Infrastructure stormwater BMPs can go by various names but all share common design principals. These are almost always built in a factory and shipped to the site to be installed. They are located underground in line with storm piping near a detention area. These devices are designed to collect debris that would otherwise pollute waterways. Other terms used to describe these stormwater practices in the Gray Infrastructure BMP family:

- Sump Structures
- Hydrodynamic Separators
- Manufactured Water Quality Units
- Manufactured Treatment Device
- Stormwater Treatment Units
- Stormwater Quality Unit
- ...virtually any combination of these terms and under many brand names



A mechanical water quality unit with a typical storm drain (First Defence)

Maintenance

1. Annual Inspection
2. Check with your city or town stormwater department to see who is responsible for the maintenance.
3. Special equipment and training is needed to remove the sediment and other pollutants. Refer to the contractor list on page 14 of this document.
4. The material removed from the unit may require special disposal.
5. Inspections and maintenance paperwork should be recorded and kept for a minimum of 5 years.

Key Considerations

1. Review the O&M Manual or construction documents for unit locations and specific instructions for the make and model of unit being maintained.
2. If the unit is not properly maintained, it can result in the release of captured pollutants into the waterways.
3. If a chemical spill has occurred or illegal dumping has entered the unit, special cleaning and special disposal of the waste may be required.
4. Inspection and maintenance should only be performed by an individual who is trained and skilled in the principles of stormwater quality. No maintenance or improper maintenance can damage the unit or cause it to be ineffective or fail. Failure can result in enforcement action from local or state government staff who are responsible to ensure these units continue to work as designed.
5. Do not block access to these units.

INFILTRATION SURFACES



What They Are

Infiltration Surfaces allow water to pass through them and enter a storage and/or filtration area below the ground surface. At the surface, these practices can be covered in specialized vegetation or turf grass; they can be exposed stone, or they can even look like a paver, asphalt, or concrete surface. They are typically located at the edge of parking areas, are the parking areas themselves, or they are incorporated into stormwater storage areas or conveyances, such as swales or bioswales.

It is critical that debris is removed from these surfaces on a regular schedule to prevent the gaps in them from clogging. Adjacent mulch beds, eroded soil, temporary placement of landscape materials, leaves, grass clippings, or placement of plowed snow on them can result in immediate failure. Failure of these surfaces can be easily identified by water standing in them for more than a day or two after the last rain.



Clean permeable pavers (top) versus clogged (bottom)

Maintenance

1. Monthly street sweeping of drivable surfaces
2. Routine vegetation management in swales or bioswales
3. Debris removal from stoned surfaces
4. Subsurface drain inspection

Key Considerations

Long term maintenance may require:

1. Paver stone replacement
2. Milling and resurfacing of pavements
3. Specialized vacuum (vactor) truck cleanings
4. Replacing exposed stone surfaces with clean washed stone



An infiltration trench to capture parking lot runoff. Subsurface access is shown in the foreground.



What They Are

Green Infrastructure stormwater BMPs can go by several names, but they all share a common design approach using living systems. They mimic nature and use the power of living plants to help filter the water, breakdown pollutants suspended in the water column, and direct water back into the ground.

Other terms used to describe stormwater practices in the Green Infrastructure BMP family:

- Rain Gardens
- Bio-Retention
- Bioswales
- Engineered Wetlands
- Wet Detention Ponds with Native Plants
- Dry Detention Ponds with Native Plants
- Vegetated Swale
- Functional Landscape



A residential rain garden

Maintenance

1. Annual inspection and record keeping
2. Invasive plant removal
3. Native plant replacement
4. Erosion control and repair
5. Trash removal

Key Considerations

1. The O&M Manual should be on file in the office of the local stormwater official of your local municipality (see page 11) or referenced to a recorded document on the subdivision plat and or easements for the BMP. A list of the intended plants should always be included in the O&M Manual and referenced when doing routine inspections and plant maintenance.
2. You may not always see it, but these BMPs often have a complex system of under drains, pipes, or special layers of soil or gravel that are part of the engineered design. It is imperative that these hidden aspects not be damaged or altered accidentally or intentionally. Inspection ports (caps or covers that connect to pipes) or other special features may be hidden just out of sight and are necessary for inspections; care should be taken to not destroy or alter these features.
3. Native plants are highly susceptible to herbicides, so limit the use of weed killers when doing maintenance.
4. Choose your maintenance contractor wisely! Traditional landscape and lawn maintenance contractors often times do not have the basic knowledge, understanding, and skills needed to properly inspect and maintain these engineered systems.
5. Ensure that maintenance activity minimizes compaction in these areas. Compacted soils do not infiltrate water efficiently.

PRESERVATION AREAS



What They Are

Preservation Areas are vegetated areas that can be or be located around water resources like streams or wetlands, as well as common areas or property buffers. Preservation Areas are often considered stormwater BMPs and need to be preserved or protected based on federal, state, and local laws to meet water quality standards. They can also be identified as Tree Preservation or Protection Area, Conservation Area, Stream Buffer Area, or Wetland.

Preservation Areas are typically identified on your construction plans or recorded documents that can be found at the recorder or county assessor's office. Preservation Areas need to be managed to remain healthy and stay in compliance.



A Preservation Area BMP in Carmel, Indiana

Maintenance

1. Tree trimming/pruning as needed for tree health or utility interference. See easement for permitted activity.
2. Invasive species management and removal
3. Tree and native plant replacement of dead or diseased material

Key Considerations

1. Review the O&M Manual, construction plans, plat language, or recorded easement to see exactly what types of activities may be allowed within these areas.
2. Typically, cutting or removal of trees within these areas is not permitted. Some easements allow small diameter trees to be removed, as long as replacement trees of similar diameter are replaced.
3. Sometimes, brush removal may be allowed, especially if it is invasive in nature, but review the specific plat language to be sure.
4. Do not grade, develop, or construct within these Preservation Areas.
5. Consider adding signage to educate homeowners and to protect the area from non-permitted activity.



A buffer Preservation Area in Carmel, Indiana

NEXT STEPS



Other Actions to Protect Water

Not everyone has a stormwater practice on or near their property, but everyone can help make a difference for our water quality. There are many simple steps we can all take to keep the water leaving our property and neighborhood cleaner.

- Minimize or eliminate fertilizer treatments on your yard
- Pick up pet poo
- Don't feed waterfowl around stormwater ponds
- Use native plants in your landscaping
- Plant trees and protect existing trees
- Keep your garden soil covered
- Adopt a storm drain and keep it clean
- If you have a septic system, make sure it is functioning properly and regularly maintained

To learn more about these actions and more, visit Indiana.ClearChoicesCleanWater.org.

Local Officials

Jason Armour, Stormwater Engineer/MS4 Coordinator
City of Fishers
(317) 595-3461
armourjt@fishers.in.us

Tim Stottlemeyer, MS4 Program Manager
City of Noblesville
(317) 776-6330 x 2615
Tstottlemeyer@noblesville.in.us

John Thomas, Storm Water Administrator
City of Carmel
(317) 571-2441
jthomas@carmel.in.gov

Michael Susong, Assistant Superintendent - Stormwater
Zionsville Street and Stormwater Department
(317) 873-4544
msusong@zionsville-in.gov

Ginger Davis
District Administrator
Hamilton County Soil and Water Conservation District
(317) 773-2181
Ginger.Davis@hamiltoncounty.in.gov

Wes Rood, Stormwater Coordinator
City of Westfield
(317) 504-2477
wrood@westfield.in.gov

Gary Duncan, Project Engineer
Hamilton County Surveyor's Office
(317) 776-8495
surveyor@hamiltoncounty.in.gov

Doug Mehlan,
Town of Cicero
(317) 984-4833
dhm1972@comcast.net

Carl Marlett
Town of McCordsville
(317) 335-3493
cmarlett@mccordsville.org

Tim McClintick, Planning Director, Town Manager
Town of Pendleton
(765) 778-8370
tmclintick@town.pendleton.in.us



The White River Alliance
1052 Woodlawn Avenue
Indianapolis, IN 46203
thewhiteriveralliance.org



Things to Consider Before You Hire A Landscape Contractor

Some stormwater BMPs might require a contractor to perform necessary maintenance. This applies to hard features like pipes and water quality units as well as green features like rain gardens. Not all contractors are created equal in this regard.

1. Ask them to describe their experience with stormwater BMPs
 - Make sure they are knowledgeable about the types of BMPs on the property
2. Ask about their knowledge of native plants
 - Request photos or references for past native plant projects and qualifications (degrees, certifications, etc.)
3. Ask them to describe their experience controlling invasive plants
 - Request photos or references for past invasive plant removal projects
 - Request that any plant cuttings be hauled off site and disposed of properly to prevent future infestations elsewhere
 - Confirm or suggest that they participate in the Central Indiana Cooperative Invasive Species Management Area (CISMA)
 - What methods, tools, strategies are used to remove invasives? Are chemicals used? What cultural and mechanical means of management are used, if any? Do they only cut brush or will they treat systemically?
4. If hiring for a new planting, ask about:
 - Staff capable of identifying first and second year seedlings; request the name of the staff and ensure they will be assigned to your project
 - Plugs or seed (drill or broadcast)? How do you ensure that seeds germinate at the highest possible rate?
 - Herbicide or tillage to remove existing vegetation? How many herbicide applications?
 - If herbicide is used adjacent to a water source (e.g. pond, stream), are aquatic sensitive herbicides (e.g. RoundUp Custom Aquatic Terrestrial Herbicide) being used? Is the applicator licensed?
 - How many species are in the mix? Are they suited to this area? Where was the seed mix sourced? Is it Pure Live Seed?
 - Warranties for the plants
 - An early invasive species monitoring and control plan
5. Ask about their fertilizer protocols
 - Will fertilizers be used throughout the planting, seeding, and maintenance of the native plant installation? Why or why not? If so, how do you determine application rates?
 - Do they test soil before applying fertilizer?
 - What type of fertilizer and herbicide products do they use; are organics an option?
 - What is their intended application schedule?
6. Confirm that their pesticide applicators are certified by the Office of the State Chemist
 - A Class 5 license is required for pond edge pesticide application
7. Confirm that they will keep lawn clippings and fertilizers off of all hard surfaces like streets and sidewalks
 - Require that they do not side-cast clippings into ponds or blow leaves to ponds, swales, rain gardens, or drainage ways
 - What measures are being utilized to ensure that soil is not being eroded, washed down drains, etc.?
 - If the contractor is not managing maintenance, will a management plan be provided?

This can be a daunting task list. Don't hesitate to contact your local stormwater official, SWCD office, or the White River Alliance for help finding the right resources.

BMP Maintenance Contractor List



Pond Maintenance

Dredging

1. Heartland Dredging
3961 Perry Boulevard
Whitestown, IN 46075
317-769-6922

2. Merrell Brothers
8811 W. 500 N.
Kokomo, IN 46901
574-699-7782

3. Wealing Brothers
4161 N 600 E
Fowler, IN 47944
219-261-2520

4. Thomas Docks
20799 Riverwood Avenue
Noblesville, IN 46062
317-774-3790

5. JS McCullough Excavating
7070 E. County Road 600 N
Bainbridge, IN 46105

Pond Treatment

1. ASAP Aquatics
3310 N. Shadeland Avenue
Indianapolis, IN 46226
317-591-9000

2. Hoosier Aquatic Care
9818 Rawles Avenue
Indianapolis, IN 46229
317-890-8010

3. Aquatic Services of Indiana
1668 Old State Road 37
Greenwood, IN 46143
317-889-6363

4. Leistner Aquatic Services, Inc.
6237 N. 25 W.
Whiteland, IN 46184
317-535-6099

5. Ponds Rx LLC
13044 Saxony Blvd
Fishers, Indiana 46037
317-219-6339

Green Infrastructure

Native Landscape Specialists

1. Williams Creek Management
4620 S. County Road 600 E
Plainfield, IN 46168
317-838-9810

2. Cardno
3901 Industrial Boulevard
Indianapolis, IN 46254
317-388-1982

3. Eco Logic LLC
8685 West Vernal Pike
Bloomington, IN 47404
812-876-7711

4. Roudebush Grading
17155 Harger Ct
Noblesville, IN 46060
317-770-9970



For shoreline and bank erosion issues, contact local lawn care or landscaping companies. Please note: this list does not serve as an endorsement of any of the companies listed. If you would like another company included, please contact Scott Minor, White River Alliance, (317) 672-7577.

BMP Contractor Contact List



Hydrodynamic Separator/Mechanical Units and Vac Trucks

Swirl Chamber Contractors

1. Fluid Waste Services

21787 Riverwood Avenue

Noblesville, IN 46062

317-773-7996

2. CSC-Commercial Sewer Cleaning
Services

5838 S. Harding Street

Indianapolis, IN 46217

800-790-0020

3. Curt & Jerry Sewer Service

1531 Deloss Street

Indianapolis, IN 46201

317-266-0000

4. LWR Waste Removal

500 Polk Street

Greenwood, IN 46143

800-551-9754

