

**NPDES PHASE II MS4 GENERAL PERMIT  
WATER QUALITY CHARACTERIZATION REPORT  
STORMWATER QUALITY MANAGEMENT PLAN**

JANUARY 2023

**Prepared for:**

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Permit #: INR040109



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**WQCR and SWQMP Certification in accordance with 327 IAC 15-4-3(i) and MS4GP 3.3 and 4.9**

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## CHAPTER 1: INTRODUCTION

As part of the 1987 amendments to the federal Clean Water Act (CWA), the United States Congress added Chapter 402(p) to the CWA to address the water quality impacts of stormwater discharges from industrial facilities and large to medium municipal separate storm sewers systems (MS4s). Large to medium MS4s were defined as communities serving populations of 100,000 or more and are regulated by the Environmental Protection Agency (EPA) under the National Pollutant Discharge Elimination System's (NPDES) Storm Water Phase I Program.

In addition to these amendments, Congress directed the EPA to issue further regulations to identify and regulate additional stormwater discharges that were considered to be contributing to national water quality impairments. In 1999, the EPA issued regulations that expanded the existing NPDES Storm Water Program to include discharges from small MS4s in "urbanized areas" serving populations of less than 100,000 and stormwater discharges from construction activities that disturb more than one acre of land. These regulations are referred to as the NPDES Phase II Storm Water Program.



Figure 1: Location of Westfield, Indiana

The City of Westfield (**Figure 1**), located in Hamilton County, has met these criteria and consequently has been designated as an MS4 entity.

In the State of Indiana, the Indiana Department of Environmental Management (IDEM) is responsible for the development and oversight of the NPDES Phase II Program. IDEM initiated adoption of the Phase II Rules that were ultimately codified as 327 IAC 15-13 (Rule 13) and became effective on August 6, 2003.

In December 2021, IDEM formally replaced Rule 13 with a new MS4 General Permit (MS4GP). Since the permits have not been updated since 2003, several new or revised provisions have been incorporated that would impact how regulated Indiana MS4 entities such as counties, cities, and towns incorporate these new changes into their existing programs. The MS4GP provides permit coverage for Phase II entities, and the requirements and conditions of the MS4GP apply to all Phase II MS4s upon submittal of a Notice of Intent (NOI).

Under Rule 13, IDEM issued approximately 185 Phase II MS4 permits in Indiana. On April 13, 2022, IDEM notified another 45 entities that they would be subject to the MS4GP regulations starting on April 13, 2023.

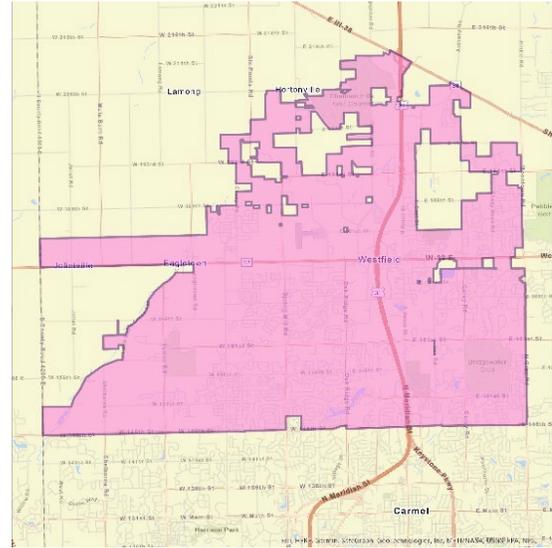
This report has been prepared to meet the requirements of the MS4GP for the development of a Water Quality Characterization Report (WQCR) and a Stormwater Quality Management Plan (SWQMP) for previously regulated and newly designated MS4s. It is also intended to replace older versions of the obsolete Rule 13 required WQCR and SWQMP; also known as Parts A, B, and C.

## 1.1 CITY OF WESTFIELD MS4 EXISTING CONDITIONS

The City of Westfield covers approximately 20,730 acres and the MS4 jurisdictional boundary mirrors the city boundaries (as of 2022) as identified on **Figure 2**. The City of Westfield’s incorporated area is located within Washington Township.

The primary responsibilities for implementing requirements included in the MS4GP are held by the City of Westfield Public Works Department, which houses the Stormwater Department. Compliance, project permitting, and inspections are performed through oversight from this department. Maintenance of the city’s infrastructure is also handled through the City of Westfield Public Works Department.

Westfield is the fourth largest municipality within Hamilton County and accounts for approximately 14.2% of the county’s population. According to StatsIndiana, the population of Westfield in 2020 was 46,410, an increase of 52.6% since 2010.



**Figure 2: MS4 Boundaries, City of Westfield**

## 1.2 MS4 CONVEYANCE SYSTEM

The MS4GP authorizes stormwater discharges from designated MS4 entities throughout the State of Indiana. The permit applies to all areas under the ownership, control, or jurisdiction of a designated MS4 entity. “MS4” refers to the permit holder, such as the city, as well as the separate storm sewer system that the city owns and operates or maintains.

MS4s are defined by the State of Indiana as a conveyance or system of conveyances owned by a state, city, county, town, district, or other public entity having jurisdiction over stormwater, including special districts under state law such as a sewer district, that discharges to waters of the United States and is designed or used for collecting or conveying stormwater. Regulated conveyance systems include roads with public drains, municipal streets, catch basins, curbs, gutters, storm drains, piping, channels, ditches, tunnels, and conduits. It does not include combined sewer overflows (CSOs) and publicly owned treatment works.

The authorized MS4 entity or city is responsible for the MS4 conveyances that it owns, operates, or maintains within the MS4 boundaries.

## CHAPTER 2: WATER QUALITY CHARACTERIZATION REPORT

### REQUIREMENT MS4GP 3.1(a):

The water quality characterization report (WCQR) shall use the most current data available but may also consider additional data that describes the chemical, biological, and/or physical condition of the receiving waters of the MS4 jurisdictional area.

## 2.1 LAND USE/LAND COVER

### REQUIREMENT MS4GP 3.1(c):

The WCQR must include: (1) An assessment of land use.

Land use and land cover can be an important tool in developing a basic overall assessment of the watershed, MS4 area, and the anticipated water quality within the receiving waters. Derived from the 2019 National Land Cover Dataset (NLCD), **Table 1** indicates the land cover (in acreage) within the jurisdictional area. Additionally, the land cover is graphically represented in **Exhibit 3**.

**Table 1: City of Westfield Land Cover**

Land Cover	Acres
Cultivated Crops	6,933.6
Developed, Low Intensity	3,477.5
Developed, Open Space	2,794.1
Developed, Medium Intensity	3,461.6
Developed, High Intensity	903.2
Barren Land (Rock/Sand/Clay)	1.3
Deciduous Forest	962.9
Evergreen Forest	25.7
Mixed Forest	28.1
Grassland/Herbaceous	209.9
Open Water	117.1
Emergent Herbaceous Wetlands	23.1
Woody Wetlands	87.0
Shrub/Scrub	15.1
Pasture/Hay	1,685.5
<b>TOTAL</b>	<b>20,725.7</b>

The effects of land use/land cover changes on surface runoff, stream flow, and groundwater recharge are fundamental considerations in stormwater management. Planned expansion of urban areas provides the opportunity to implement policies and best management practices (BMPs) that may significantly reduce or prevent impacts to the environment in terms of groundwater recharge, water pollution and stormwater drainage. Urbanization typically includes additional impervious surfaces and increased runoff which can result in downstream flooding, and detrimental impacts to local waterways. Since each land use/land cover may have a different impact on stormwater runoff, strategic land use planning can help minimize these impacts.

The city's long-term plan anticipates further development of agricultural areas into suburban residential areas and new suburban areas to match continual growth within the city. Additional development is anticipated along the existing US 31 corridor, with further development of employment centers, regional commercial areas, and business parks expected along SR 32.

## 2.2 MS4 OWNED AND OPERATED STRUCTURAL STORMWATER MANAGEMENT MEASURES

### REQUIREMENT MS4GP 3.1(c):

The WCQR must include: (2) An inventory of MS4 owned/operated structural stormwater management measures...including an identification number, geographic coordinate, and structure condition.

City of Westfield MS4 publicly owned and/or operated structural BMPs within the jurisdictional area are listed in **Table 2**. BMPs are grouped by type, and the inventory includes an identification number and overall condition based on the last assessment or inspection. These structures are managed through the city's asset management database and work orders. Specific geographic coordinates are maintained in the GIS layer and are available from the city upon request.

**Table 2: City of Westfield MS4 Owned and/or Operated Structural BMPs**

Structural BMP Type	Identification Number	Structural Condition	Approximate Location
Bioretention basin	BR001	Good	SW corner 161 <sup>st</sup> St./Carey Rd.
	BR002	Good	Westfield City Services
	BR003	Good	17950 Grassy Branch Rd.
	BR004	Good	NW corner SR 32/Sun Park Dr.
	BR005	Good	NE corner SR 32/Sun Park Dr.
	BR006	Good	151 <sup>st</sup> St. W of US 31
Bioswale	BS001	Good	SE corner 191 <sup>st</sup> St./Tomlinson Rd.
	BS002	Good	SW 151 <sup>st</sup> St./Carey Rd.
Dry detention	DD001	Good	Freedom Trails Park
	DD002	Good	Grand Park east of Lot H
Hydrodynamic separator	HS001	Good	211 S. Union St.
Porous pavers	PP001	Good	Northwalk Circle
	PP002	Good	Northwalk Circle
	PP003	Good	Westfield City Services
Rain gardens	RG001	Good	Northwalk Circle
	RG002 – RG011	Good	Union St. from Mill St. to Union Flats Blvd.
Underground detention	UD001	Good	Northwalk Circle
Wet pond	WP001	Good	Grand Park west of Fieldhouse
	WP002	Good	Westfield Public Safety
	WP003	Good	SE corner 171 <sup>st</sup> St. & Ditch Rd.
Regional detention	RD001	Good	Grand Junction

## 2.3 RECEIVING WATERS

### REQUIREMENT MS4GP 3.1(c):

The WCQR must include: (3) Identification of all receiving waters that receive discharges from outfalls within the MS4, including wetlands and lakes. (4) Any 303d listed impaired waters or TMDLs for receiving waters need to be identified.

The city discharges stormwater into the receiving waters listed in **Table 3**. These waterbodies are also identified on **Exhibit 2**.

**Table 3: City of Westfield Receiving Waters**

Bear Creek	Lindley Ditch
Cool Creek	Little Eagle Creek
East Fork Sly Run	West Fork Sly Run
Grassy Branch	Williams Creek
Jones Ditch	Woodruff Branch
Kirkendall Creek	

### 2.3.1 Watersheds

According to the U.S. Geological Survey (USGS), watersheds are delineated using a nationwide system based on surface hydrologic features. According to the USGS, this system divides the country into 21 regions (two-digit), 222 subregions (four-digit), 370 basins (six-digit), 2,270 subbasins (eight-digit), approximately 20,000 watersheds (ten-digit), and 100,000 sub-watersheds (12-digit). A hierarchical hydrologic unit code (HUC) consisting of two additional digits for each level in the hydrologic unit system is used to identify any hydrologic area.

The MS4 area overlays portions of one eight-digit HUC watershed; the Upper White River Basin (HUC 05120201). The 12-digit HUCs (based on 2022 MS4 boundaries) along with the acreages in the MS4 are listed in **Table 4**.

**Table 4: City of Westfield Watersheds**

HUC 12	Name	Acres in MS4
051202011001	Cool Creek	8,080.1
051202010609	Hinkle Creek	1,042.5
051202011104	Lion Creek-Little Eagle Creek	7,018.4
051202010610	Morse Reservoir-Cicero Creek	992.1
051202011002	Vestal Ditch-White River	2,107.8
051202011004	Williams Creek	1,485.0

### 2.3.2 Integrated Waters Report

Section 303(d) of the CWA requires states to identify waters that do not or are not expected to meet applicable water quality standards with technology-based standards alone. States must also prioritize these waters based on the designated uses of the water and the severity of the pollution. Once this listing and ranking of waters is completed, states are required to develop Total Maximum Daily Loads (TMDLs) for these waters in order to achieve compliance with water quality standards.

Section 305(b) of the CWA requires the state to assess and report on how well the waters of Indiana support the beneficial uses designated in the Water Quality Standards (WQS). Indiana's Integrated Water Monitoring and Assessment Report (IR) is developed every two years to fulfill this requirement

and describes the condition of Indiana’s lakes and streams, the Lake Michigan shoreline, and ground water. All IDEM water quality data is evaluated and interpreted for each hydrologic unit area (HUA); typically, a 12-digit HUC. Each HUA is given a water quality rating relative to its streams’ status in meeting WQS. WQS are set at levels necessary for protecting a waterway’s designated use(s), such as swimmable, fishable, or drinkable. **Table 5** identifies known impairments (*E. coli* and polychlorinated biphenyls – PCBs) for HUAs within the MS4 area.

**Table 5: City of Westfield 303(d) Impaired Waters**

Segment ID	Waterbody Name	Impairment
INW01A1_03 INW01A1_04 INW01A1_T1005 INW01A1_T1003 INW01A1_T1004	Cool Creek	<i>E. coli</i> , Recreational Use
INW01A1_T1001	Grassy Branch	<i>E. coli</i> , Recreational Use
INW0169_T1002	Jones Ditch	<i>E. coli</i> , Recreational Use
INW0169_T1003	Lindley Ditch	<i>E. coli</i> , Recreational Use
INW01B4_03 INW01B4_04 INW01B4_05 INW01B4_T1002	Little Eagle Creek	<i>E. coli</i> , Recreational Use
INW016A_T1004 INW016A_T1005	Sly Run	<i>E. coli</i> , Recreational Use
INW01B4_T1001	Woodruff Branch	<i>E. coli</i> , Recreational Use

### 2.3.3 Total Maximum Daily Loads

The prioritized 303(d) list of impaired waters is then used to develop a list of waters for which a TMDL must be developed. These TMDL reports identify the causes of the impairments, the amount of pollutant reduction needed, and potential actions to be taken to improve water quality within the watershed. **Table 6** identifies TMDLs relevant to the City of Westfield’s MS4 jurisdictional boundaries and the pollutant for which it was developed. Additional information regarding established TMDLs for Westfield exists in Section 2.5.2.

**Table 6: City of Westfield TMDLs**

Waterbody Name	Pollutant	Link to Report
Cicero Creek Watershed	<i>E. coli</i>	<a href="https://www.in.gov/idem/nps/resources/total-maximum-daily-load-reports/cicero-creek/">https://www.in.gov/idem/nps/resources/total-maximum-daily-load-reports/cicero-creek/</a>
West Fork White River (Muncie to Hamilton-Marion County Line)	<i>E. coli</i>	<a href="https://www.in.gov/idem/nps/resources/total-maximum-daily-load-reports/white-river-west-fork-muncie-to-hamilton-marion-county-line/">https://www.in.gov/idem/nps/resources/total-maximum-daily-load-reports/white-river-west-fork-muncie-to-hamilton-marion-county-line/</a>

### 2.3.4 Wetlands

The 2020 National Wetlands Inventory (NWI) identifies potential wetland areas by utilizing infrared photography which has not been field verified. Information provided through the NWI should be utilized only as a reference, not as a definitive answer of whether wetlands are present on a particular site. According to the 2020 NWI, there are approximately 680 acres of potential wetlands within the MS4 area.

The MS4GP requires MS4s to establish a construction program that contains, at a minimum, the requirements of the Indiana Construction Stormwater General Permit (CSGP). The CSGP requires all project site owners to develop construction plans that include an existing project site layout describing

the location and name of all wetlands, lakes, and water courses on or adjacent to the project site (CSGP 4.1(a)(3)(j)).

## 2.4 SENSITIVE AREAS

### REQUIREMENT MS4GP 3.1(c):

The WQCR must include: (5) Identification of known sensitive areas including, but not limited to public swimming areas, drinking water intakes, habitats associated with threatened or endangered species, and outstanding state and national resource waters.

These areas are designated as sensitive due to their importance to the surrounding environment or economic conditions. Special considerations or restrictions may be imposed to provide an added layer of protection for those areas or land uses designated as sensitive by the MS4 or IDEM.

### 2.4.1 Public Swimming Areas

The primary recreational water located within the MS4 area is Cool Creek. Cool Creek County Park is a 90-acre park located along North Meridian St. and 151<sup>st</sup> St. that provides access to Cool Creek and yields opportunities for swimming, boating, and canoeing. This park will be considered as a sensitive area, as well as its corresponding 12-digit HUC.

### 2.4.2 Drinking Water Intakes

According to the Indiana Administrative Code, a public water supply system is a public water supply for the provision to the public of piped water for human consumption, if such a system has at least fifteen (15) service connections, or regularly serves an average of at least twenty-five (25) individuals daily at least sixty (60) days of the year.

IDEM's Drinking Water Branch carries out the requirements of the federal Safe Drinking Water Act (SDWA), which is designed to ensure that Public Waters Supplies (PWS) deliver water to Hoosier homes and businesses that is adequate in quantity and is safe to drink. According to the Branch, there are 174 drinking water wells in Hamilton County, 68 of which are active. Within the City of Westfield, there is one active non-community well, one inactive community well, and three inactive non-community wells.

The Indiana Department of Natural Resources' (IDNR) Division of Water conducts resource assessments of groundwater aquifers and maintains the records of over 400,000 water wells drilled in Indiana. A 2019 GIS Layer provided by the IDNR of showed 655 wells within the Westfield area.

### 2.4.3 Habitat Associated with Threatened or Endangered Species

The IDNR's Division of Nature Preserves maintains the Natural Heritage Data for the State of Indiana. Natural Heritage Data includes general information on endangered, threatened, and rare species for each Indiana county. As of February 2022, there are seven mollusks, one insect, two reptiles, five birds and five vascular plants listed as endangered, threatened, or rare within Hamilton County. Additionally, the IDNR identifies Wet-mesic Floodplain Forest and Flatwoods Central Till Mesic Upland Forest are listed as High Quality Natural Communities within Hamilton County. However, Natural Heritage Data is only county specific, and therefore, these habitat types may not exist within the MS4 area.

City officials are unaware of any waters within the MS4 area that currently contain threatened, endangered, or rare species or their habitats. If any species listed are identified in the future, the partners will consider those locations to be sensitive areas and will update their stormwater program accordingly.

#### 2.4.4 Limited Use and Outstanding State Resource Waters

The federal CWA requires all states to develop, review, revise, and adopt WQS, which consist of:

- **Designated Uses:** identification of how people, aquatic communities and wildlife use our waters (e.g., public water supply, protection and propagation of fish, shellfish, and wildlife, and recreation).
- **Water Quality Criteria:** numeric or narrative in form and protect the designated uses. Numeric criteria are allowable concentrations of specific pollutants in a water body while narrative criteria are statements of unacceptable conditions in and on the water.
- **Antidegradation Policies:** protection of existing uses and extra protection for high-quality or unique waters.

General antidegradation policies will allow the city to protect existing uses of waterbodies and aid in ensuring these waterbodies will continue to meet WQS. Waters that may be considered for designation as outstanding state resource waters (OSRW) include waterbodies that have unique or special ecological, recreational, or aesthetic significance. According to the Natural Resource Commission’s “Outstanding Rivers List for Indiana”, there are no specially listed waters within the MS4 boundaries.

#### 2.4.5 Westfield Stormwater Master Plan

An update to the City of Westfield Stormwater Master Plan (SWMP) was completed in 2022 and investigated potential water quality and quantity issues in order to provide recommended solutions to addressing existing and future problems related to growth and drainage. The SWMP includes summaries of watershed health and vulnerability indexes for the six watersheds that drain land in the City of Westfield. TMDL studies were also reviewed to summarize waterbody and aquatic life condition and recreational use designation. Results indicated that there is a range of stream quality within the city, which can be linked to residential and commercial growth patterns. The SWMP will continue to be used to guide MS4 program implementation.

#### 2.4.6 Other Sensitive Areas

**Erodible Soils:** The Natural Resource Conservation Service (NRCS) uses the soil erodibility index (EI) to provide a numerical expression of the potential for a soil to erode considering the physical and chemical properties of the soil and the climactic conditions where it is located. As a result, the basis for identifying highly erodible land (HEL) is the EI of the soil map unit.

The EI of a soil is determined by dividing the potential erodibility for each soil by the soil loss tolerance (T) value established for the soil. The T value represents the maximum “tolerable” annual rate of soil erosion that could take place without causing a decline in long-term productivity. **Table 7** documents the HEL and Potentially HEL (PHEL) soils within Hamilton County and therefore potentially throughout the MS4 area. A map showing HEL and PHEL soils within the MS4 area is included in **Exhibit 4**.

Table 7: City of Westfield Erodible Soils

Map Unit Symbol	Soil Name	HEL Classification
CrA	Crosby	PHEL
FnB2	Fox	PHEL
FxC3	Fox	HEL
HeF	Hennepin	HEL
MmB2, MmC2	Miami	PHEL
MmC2, MmD2, MoC3	Miami	HEL
OcB2	Ockley	PHEL
Pt	Pits	PHEL

Recognizing the potential water quality impacts associated with soil erosion, the partners will consider these soils to be sensitive areas and will prioritize new or redevelopment occurring on these sites during the plan review, inspection, and enforcement process. Current provisions in the City of Westfield ordinance include limiting soil erosion into waterways and stormwater infrastructure.

## 2.5 REVIEW OF EXISTING WATER QUALITY DATA

### REQUIREMENT MS4GP 3.1(c):

The WQCR must include: (6) A review and summary of existing and available monitoring data of the MS4 receiving waters, including, as applicable, data that can be correlated from stream reach characterization and evaluation reports (SRCER).

### 2.5.1 Stream Reach Characterization and Evaluation Report (SRCER)

The stream reach characterization and evaluation report (SRCER) characterizes and evaluates the pollutant sources on receiving waters from a combined sewer system discharge. The SRCER can be utilized to identify ways to beneficially change the storm sewer system within the MS4 and to improve water quality around combined sewer system outfalls. The City of Westfield does not have any combined sewer system and therefore, is not required to complete a SRCER.

### 2.5.2 Established TMDLS

States are required to develop a priority ranking for waters that do not or are not expected to meet applicable water quality standards taking into account the severity of pollution and the designated uses of the waters. Once this listing and ranking of waters is completed, the states are required to develop TMDLs for these waters in order to achieve compliance with water quality standards. The relevant TMDLs developed to date are described in the following sections. Many of the TMDLs propose similar BMPs to reduce pollutants, especially *E. coli*. These BMPs may include:

- Septic system outreach program and funding to help fix/replace failing systems;
- Identification of failing septic systems by local health departments. Requirements for periodic pumping and inspection of septic systems;
- Livestock exclusion from riparian areas;
- Installation of structural urban BMPs; and
- Education campaigns designed to address relevant nonpoint source pollutants from the actions of watershed residents.

Regarding the inputs of *E. coli* from MS4 communities, the TMDLs anticipate that the issuance and implementations of MS4 permits will improve water quality and address storm water impacts in these watersheds. TMDLs relevant to the City of Westfield are included below.

#### **Cicero Creek Watershed *E. coli* TMDL**

Finalized in September 2011, the TMDLs for the Cicero Creek Watershed (Cicero Creek, Little Cicero Creek, Prairie Creek, Dixon Creek, Sloan Ditch, Buck Creek, and other tributaries to Morse Reservoir) were established to address *E. coli* impairments. The TMDL report indicates that “pollution sources in the watershed include nonpoint sources from agriculture and pastures, land application of manure and urban and rural run-off as well as point sources from straight pipe discharges, home sewage treatment system disposal and combined sewer overflow outlets.” TMDLs in the watershed are established for *E. coli* and address 27 impairments through storm water controls, point source controls, manure management and habitat improvements.

#### **West Fork White River (Muncie to Hamilton-Marion County Line) *E. coli* TMDL**

Finalized in 2004, the TMDL report for the West Fork White River Watershed (Muncie to Hamilton-Marion County Line) indicates that “potential sources of *E. coli* and fecal coliform in the watershed include nonpoint sources from agriculture and pastures, land application of manure and urban and rural run-off, as well as point sources from straight pipe discharges, home sewage treatment system disposal and combined sewer overflow outlets.” The West Fork White River from Muncie to the Hamilton-Marion County line drains approximately 1,100 square miles in central Indiana. TMDLs in the watershed are established for *E. coli* and address 12 impairments through storm water controls, point source controls, manure management and habitat improvements.

### **2.5.3 Watershed Management Plans**

A watershed management plan (WMP) is a strategy for achieving water quality goals by characterizing the watershed, setting goals and actions steps, and developing an implementation plan to address documented problems. Ultimately, the purpose of the WMP is to guide resource managers, watershed coordinators, policy makers, community organizations, and other relevant stakeholders in restoring and protecting the waterbodies within a given watershed. Information about one of the most recent WMPs relevant to the City of Westfield waters and watersheds can be found in this section. Other WMPs for the city exist but are outdated and not relevant to this document. These are listed at the end of this section.

#### **Morse Reservoir-Cicero Creek WMP (2011)**

The 2011 Morse Reservoir/Cicero Creek WMP outlines several goal statements that were developed based on concerns and pollutant sources identified during the development of the WMP. It is anticipated that the implementation of policies and programs to meet these goal statements will improve watershed management in the Morse Reservoir/Cicero Creek Watershed. The goal statements included in the WMP are:

- Reduce nutrient loads so that there are no exceedances of EPA's suggested targets for nitrate + nitrite of 1.6 mg/L and Total Phosphorus of 0.076 mg/L.
- Reduce sediment loads to meet the IDEM statewide draft TMDL target of 30 mg/L for total suspended solids (TSS).
- Develop and implement an education and outreach program within the watershed.

- Reduce *E. coli* concentrations to meet the state standard of 235 CFU/100mL.

#### **Additional WMPs Relevant to the City of Westfield MS4**

- Cool Creek WMP (2005)
- Eagle Creek WMP (2005)

## **2.6 POTENTIAL AREAS OF POLLUTION**

### **REQUIREMENT MS4GP 3.1(c):**

The WQCR must include: (7) Identification of areas that have a reasonable potential for or are actually contributing to stormwater quality problems based on available land use and complaint information and relevant chemical, biological, and physical data.

### **2.6.1 Complaint Data**

When concerns are observed by the city staff, they are equipped to mitigate the issues quickly. Observations of a potential illicit discharge or other stormwater concerns, either received directly by city staff or through the customer relationship management (CRM) ticket system, are investigated and tracked through photographs and reports. Determined by the nature and severity of the issue, violation notices or fines may be issued. These complaints and observations are not currently tracked by location to develop trend data.

### **2.6.2 Industrial Facilities**

The City of Westfield is aware of 67 facilities within the MS4 boundary which, according to their Standard Identification Classification (SIC) code, should be assessed for their potential to discharge to an MS4 conveyance. While they may also have IDEM Rule 6 permits, it is important for the city to understand the potential impacts to the conveyances and receiving waters. It is also important to note that IDEM is currently working on a replacement, master general permit for Rule 6.

### **2.6.3 Residential Septic Systems**

Existing City of Westfield policies dictate all new developments occurring within the city are required to connect to the sanitary sewer system if service is readily available. However, when sanitary sewer service is not available, on-site wastewater treatment permits are issued by the Hamilton County Health Department, if site conditions meet all applicable Indiana State Department of Health Standards.

### **2.6.4 Surface Visual Conveyance Inspection Findings**

In compliance with the MS4GP Municipal Operation Pollution Prevention and Good Housekeeping Minimum Control Measure (MCM), MS4 entities are tasked with completing a visual inspection of catch basins, outfalls, and conveyance systems over the five-year permit term with a minimum of 15% must be completed each year. Areas anticipated to contribute to pollution or decrease system function must be noted and corrected. As of the development of this document, this inspection program has not been developed or started.

## 2.6.5 IDDE Findings

A community should understand the extend of water quality problems caused by illicit discharges. The desktop assessment should draw on existing background and anecdotal information to initially characterize illicit discharge potential at the sub-watershed level. Sub-watersheds are then screened based on their composite score, and are designated as having a low, medium, or high risk. **Table 8** describes discharge factors to screen sub-watersheds based on their illicit discharge potential (IDP).

**Table 8: Discharge Screening Factors for IDDE Desktop Assessment**

Discharge Screening Factors	Defining and Deriving the Factor
Past Discharge Complaints and Reports	Frequency of past discharge complaints, hotline reports, and spill responses per subwatershed. Any subwatershed with a history of discharge complaints should automatically be designated as having high Illicit Discharge Potential (IDP).
Poor Dry Weather Water Quality	Frequency that individual samples of dry weather water quality exceed benchmark values for bacteria, nutrients, conductivity or other predetermined indicators. High risk if two or more exceedances are found in any given year.
Density of Generating Sites or Industrial NPDES Storm Water Permits	Density of more than 10 generating sites of five industrial NPDES stormwater sites per square mile indicates high IDP. Density determined by screening business or permit databases.
Stormwater Outfall Density	Density of mapped stormwater outfalls in the subwatershed, expressed as the average number per stream or channel mile. A density of more than 20 outfalls per stream mile indicates high IDP.
Age of Subwatershed Development	Defined as the average age of the majority of development in a subwatershed. High IDP is often indicated for developments older than 50 years. Determined from tax maps and parcel data, or from other known information about neighborhoods.
Sewer Conversion	Subwatersheds that had septic systems but have been connected to the sanitary sewer system in the last 30 years have high IDP.
Historic Combined Sewer Systems	Subwatersheds that were once served by combined sewer system but were subsequently separated have a high IDP/
Presence of Older Industrial Operations	Subwatersheds with more than 5% of its area in industrial sites that are more than 40 years old are considered to have high IDP. Determined from historic zoning, tax maps, and "old-timers."
Aging of Failing Sewer Infrastructure	Defined as the age and condition of the subwatershed sewer network. High IDP is indicated when the sewer age exceeds design life of its construction materials (e.g., 50 years) or when clusters of pipe breaks, spills, overflows or are reported by sewer authorities
Density of Aging Septic Systems	Subwatersheds with a density of more than 100 older drain fields per square mile are considered to have high IDP. Determined from analysis of lot size outside sewer service boundaries.

## 2.7 DATA SUMMARY

### **REQUIREMENT MS4GP 3.1(c):**

The WQCR must include: (8) An evaluation of data collected to determine which areas or specific discharge points that may need to be considered for future planning and implementation of new stormwater measures or modification of existing measures. The highest priority should be given to sensitive areas and the prohibition of new or significantly increased MS4 discharges.

Several sensitive areas have been identified for special considerations related to stormwater quality runoff and land cover/land use changes. These areas include drinking water sources, wetlands, habitats of endangered, threatened, or rare species, and recreational waters. These areas, and any identified discharge points near these areas, should be evaluated for the potential addition of structural or non-structural BMPs to maximize the possible protection for the area as well as the receiving waters. Types of BMPs for consideration may include targeted education and awareness programs highlighting the importance of sensitive areas, additional requirements for structural controls on new construction, and/or enhanced post-construction structural BMPs. The structural condition of the current MS4 owned and operated BMPs will guide the prioritization of BMP maintenance and repairs over the current MS4GP permit cycle.

Seven waterbodies within the City of Westfield (Cool Creek, Grassy Branch, Lindley Ditch, Jones Ditch, Little Eagle Creek, Sly Run and Woodruff Branch) are known to have impairments and are 303(d) listed. Through the implementation of the MS4GP within the city, goals to improve the water quality of impaired waterbodies will be tracked and revised during annual reviews of the program. Outfall mapping and field investigations during dry weather screening will yield any priority areas to be addressed during additional public education and outreach, as well as identify existing BMPs that require repair and/or maintenance. Active construction sites that are greater than five acres and that are a near water resource will have an elevated inspection priority, and post-construction inspections will identify areas needing maintenance or repair which will have a direct positive impact on water quality.

As the City of Westfield plan for future growth and development, land use changes are anticipated within areas of the MS4. These areas include the west and northwest regions of the city, where both residential and commercial development is planned. This growth can certainly have impacts on the MS4 program as well as the water quality of receiving waters. The city will continue working to improve water quality in the relevant impaired waterbodies through public education and outreach, as well as expanding the IDDE program to meet the requirements of the MS4GP.



## CHAPTER 3: STORMWATER QUALITY MANAGEMENT PLAN

### REQUIREMENT MS4GP 4.2:

The SWQMP must be developed, implemented, and maintained to include provisions that will reduce the discharge of pollutants from the MS4 to protect water quality, human health, and the biotic community.

### 3.1 MS4 ADMINISTRATION

While the MS4 program oversight will be provided by the Public Works Department as noted in Section 1.1, other departments, staff members, and partners will be responsible for the implementation of individual MCMs and tasks. Responsible parties are included in the BMP tables in the following sections.

The City of Westfield participates in a regional approach to collaborate with other MS4 communities regarding the Public Education, Outreach, Participation and Involvement MCM. The White River Alliance (WRA) has been the umbrella organization for the regional work group and signs an MOU each year with member communities to outline the work plan and deliverables. Annually, the member MS4 communities review the long-term plan and adjust the annual work plan accordingly. Each MS4 community is then responsible for their own local implementation of the resources developed.

### 3.2 MCM PROGRAM DESCRIPTIONS

#### REQUIREMENT MS4GP 4.2(a):

The SWQMP must at a minimum include:

- (3) Program goals that are established and required by this permit and others identified by the MS4 entity to address local stormwater resource issues within their jurisdiction.
- (4) A detailed program description for each minimum control measure (MCM):
  - (A) A timetable for SWQMP implementation for each MCM and the WQCR
  - (B) A summary of measurable goals for each MCM and a discussion of environmental impact
  - (C) Individuals that are responsible for implementing each MCM including their contact information

#### 3.2.1 Programmatic Indicators

Programmatic indicators are categories of data collected throughout the annual period by the MS4 entity which are used to measure implementation of each of the MCMs. These indicators pertain to specific environmental gauges that focus on the impacts of stormwater runoff. IDEM utilizes the indicators to determine the degree of success achieved by the stormwater management programs. IDEM requires an annual update for each indicator and if an indicator is not applicable to the MS4 operator, then the operator shall provide rationale for the non-applicability.

Each of the programmatic indicators have been addressed by BMPs within the MS4 entity. For reference, programmatic indicators are listed in **Appendix 1**.

### 3.2.2 Public Education, Outreach, Participation and Involvement

An MS4 must develop strategies to inform constituents and target groups of the impacts that polluted stormwater runoff can have on water quality and ways they can minimize their impact on stormwater quality.

The city continues to work with the White River Alliance, Hamilton County Soil and Water Conservation District (SWCD), and the Hamilton County Solid Waste Management District (SWMD) to provide public information and outreach services while also playing a major role in the public involvement and participation activities related to the household hazardous waste and recycling efforts.

**Table 9** provides a summary of the Public Education, Outreach, Participation and Involvement BMPs to be implemented and identifies the associated measurable goals, timeline, priority areas, and responsible parties.

**Table 9: Public Education, Outreach, Participation and Involvement BMPs**

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking and Programmatic Indicators	Timeline	Responsible Party
<p><b>Public Education and Involvement Plan</b></p> <p>(4.3(a))</p>	<ul style="list-style-type: none"> <li>• Identify target constituents</li> <li>• Develop a stormwater public education and involvement plan</li> <li>• Develop list of three community wide stormwater issues to assist with education and involvement efforts for construction, residential and commercial/industrial groups</li> <li>• Develop or collaborate with existing efforts to conduct two public events annually</li> <li>• Develop educational materials</li> <li>• Provide annual training to construction site run-off and post-construction target groups</li> <li>• Assist with development and implementation of WRA Strategic Plan to help guide overall efforts</li> </ul>	<ul style="list-style-type: none"> <li>• Plan developed with partner agency and department input by January 2023</li> <li>• Reviewed annually and revised as needed</li> <li>• Events and activities will be decided in conjunction with development and annual review of the education and involvement plan</li> <li>• Maintain a list of topics covered and constituents reached for each event</li> </ul>	<ul style="list-style-type: none"> <li>• January 2023 (developed)</li> <li>• January 2024</li> <li>• January 2025</li> <li>• January 2026</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> </ul>
<p><b>Stormwater Educational Materials</b></p> <p>(4.3(a)(4)) (4.3(b)) (4.3(d))</p>	<ul style="list-style-type: none"> <li>• Collaborate to develop, produce, or distribute printed materials related to stormwater issues</li> <li>• Include information related to proper disposal of wastes</li> <li>• Assist with larger efforts such as those similar to MS4 video production, workshops, etc.</li> <li>• Work with other local MS4 entities or the WRA to develop, produce, or distribute printed materials</li> </ul>	<ul style="list-style-type: none"> <li>• Materials and opportunities will be discussed during the development and annual review of the education and involvement plan</li> <li>• Work in cooperation with partners to broaden exposure and present a unified message</li> <li>• Maintain a list of materials developed, distributed, and utilized</li> </ul>	<ul style="list-style-type: none"> <li>• January 2023 (plan)</li> <li>• January 2024</li> <li>• January 2025</li> <li>• January 2026</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> </ul>

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking and Programmatic Indicators	Timeline	Responsible Party
<p><b>Web Page</b></p> <p>(4.3(c))</p>	<ul style="list-style-type: none"> <li>• Maintain the Stormwater Program web page regarding stormwater issues, a location to report stormwater quality issues, and links to other sites</li> <li>• Include articles developed, brochures, and calendar updates</li> <li>• Include ordinances, applicable fees, and MS4 program information</li> <li>• Provide relevant stormwater updates and postings on web page and/or other partner's social media outlets</li> <li>• Utilize information from White River Alliance webpage &amp; social media</li> </ul>	<ul style="list-style-type: none"> <li>• Utilize education and involvement plan to identify messages, issues, and partners</li> <li>• Review web page and update with new information annually</li> <li>• Track total number of hits site receives each year</li> <li>• Document all questions and comments received via the web page as well as the responses to them</li> <li>• Document posts relevant to stormwater issues</li> </ul>	<ul style="list-style-type: none"> <li>• January 2023</li> <li>• December 2023</li> <li>• December 2024</li> <li>• December 2025</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> </ul>
<p><b>Elected Official Update</b></p> <p>(4.3(e))</p>	<ul style="list-style-type: none"> <li>• Report stormwater program updates to elected officials or an advisory board</li> </ul>	<ul style="list-style-type: none"> <li>• Updates will be provided at the January meeting of the City Council</li> <li>• Maintain a list of attendees and materials distributed</li> </ul>	<ul style="list-style-type: none"> <li>• January 2023</li> <li>• January 2024</li> <li>• January 2025</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> </ul>
<p><b>Household Hazardous Waste (HHW) and Recycling Activities</b></p> <p>(4.4(b)(4))</p>	<ul style="list-style-type: none"> <li>• Encourage citizens to use existing county HHW drop off for proper disposal</li> <li>• Utilize existing SWCD activities educate residents about illicit discharges, proper disposal of waste, and the curb-side recycling program</li> <li>• Utilize existing SWMD activities to educate community members on the importance of pollution prevention and recycling programs</li> </ul>	<ul style="list-style-type: none"> <li>• Promote the HHW facilities operated by the SWMD</li> <li>• Document the amount of material collected at the HHW facility</li> <li>• Document dates, times, and attendance at all presentations to citizen and school groups that incorporate stormwater quality discussions</li> <li>• Document the number of stormwater materials distributed on an annual basis</li> </ul>	<ul style="list-style-type: none"> <li>• On-going</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> <li>• Hamilton County SWCD</li> <li>• Hamilton County SWMD</li> </ul>

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking and Programmatic Indicators	Timeline	Responsible Party
<p><b>Public Reporting Program</b></p> <p>(4.4(b)(6))</p>	<ul style="list-style-type: none"> <li>Utilize stormwater email and CRM ticket system to field complaints from the public on illegal dumping, illicit discharges, poor erosion control practices, and other activities that negatively impact stormwater quality</li> </ul>	<ul style="list-style-type: none"> <li>Implement the pollution hotline program</li> <li>Promote, advertise, and follow-up on complaints and calls received through the stormwater email and CRM ticket system</li> <li>Include educational material developed</li> <li>Respond to complaints</li> <li>Document the number of complaints received and all follow up actions taken on reports</li> </ul>	<ul style="list-style-type: none"> <li>On-going</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> </ul>
<p><b>Partnership Activities</b></p>	<ul style="list-style-type: none"> <li>Support SWCD activities to help implement the county-wide “Backyard Conservation” program</li> <li>Support the planning and coordinating of the annual White River Clean-up Event</li> <li>Work with other regional groups and organizations that share common goals</li> </ul>	<ul style="list-style-type: none"> <li>Provide education and outreach programs for target constituents</li> <li>Track number of stormwater related articles or materials published</li> <li>Document dates, times, and attendance at all workshops &amp; trainings focused on stormwater quality related issues</li> <li>Annually partner with at least one other MS4, watershed group, or volunteer organization</li> </ul>	<ul style="list-style-type: none"> <li>On-going and annual activities</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> <li>Hamilton County SWCD</li> <li>White River Alliance</li> </ul>

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking and Programmatic Indicators	Timeline	Responsible Party
<p><b>Annual Report</b></p> <p>(4.3(g)) (4.3(h))</p>	<ul style="list-style-type: none"> <li>Assess the program annually</li> <li>Report progress in an annual report to IDEM</li> </ul>	<ul style="list-style-type: none"> <li>Assess program in conjunction with gathering data and compilation of the annual report</li> <li>Include: <ul style="list-style-type: none"> <li>List of each public participation and outreach event and activity conduction, a description of the activity, an estimate of the number of attendees, and an assessment if the goals and objectives were met</li> <li>The number and types of construction and/or post-construction stormwater training opportunities what were provided to contractors, developers and builders, property owners (commercial, industrial, residential, homeowner associations, and other targeted entities during the reporting period</li> <li>Documentation that presentations were made to elected officials or boards</li> <li>Describe each targeted audience selected and how they were reached during the reporting period and describe behavioral changes observed</li> <li>A list of all public education materials used during the reporting period</li> </ul> </li> <li>Submit annual report</li> </ul>	<ul style="list-style-type: none"> <li>February 2023</li> <li>February 2024</li> <li>February 2025</li> <li>February 2026</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> </ul>

### 3.2.3 Illicit Discharge Detection and Elimination

An MS4 must develop a program which uses education and both structural and non-structural BMPs to detect, address, and eliminate illicit discharges into the MS4 conveyance system. Problem areas must be located via dry weather screening or other means, the source must be determined illicit connections must be removed or otherwise corrected, and the actions taken must be documented. Through an ordinance or other regulatory mechanism, illicit discharges must be prohibited from entering the MS4 conveyances and appropriate enforcement procedures and actions are required.

The Illicit Discharge Detection and Elimination (IDDE) BMPs outlined in **Table 10** will be implemented by the MS4 staff in order to comply with the minimum requirements of the MCM. The programs are designed to gain a thorough awareness of their separate storm conveyance system and thereby allowing the identification and elimination of illicit discharges entering the system. The program also establishes the legal, technical, and educational means needed to eliminate illicit discharges.



**Table 10: IDDE BMPs**

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking, and Programmatic Indicators	Timeline	Responsible Party
<b>IDDE Ordinance</b> (4.4(a))	<ul style="list-style-type: none"> <li>Review IDDE language contained in the “City of Westfield Stormwater Management Ordinance 05-30” for needed updates and to ensure compliance with the MS4GP</li> </ul>	<ul style="list-style-type: none"> <li>Enforce ordinance</li> <li>Review policies at least once per permit term</li> </ul>	<ul style="list-style-type: none"> <li>January 2023 (review/update)</li> <li>Implementation throughout permit term</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> </ul>
<b>IDDE Plan</b> (4.4(b)) (4.4(h))	<ul style="list-style-type: none"> <li>Review the IDDE plan and update as necessary to reflect the proposed actions for illicit discharge detection and elimination in the current permit term</li> <li>Implement the IDDE plan to detect, address, and eliminate illicit discharges into the MS4 conveyance system</li> <li>Include SOPs to locate problem areas and to ensure consistent investigations for all illicit discharges</li> <li>Update the IDDE plan to include follow-up screening protocols, checklist, and current industrial facilities information</li> <li>Investigate transient illicit discharges that have been reported to the MS4 Coordinator for additional follow-up</li> <li>Utilize the Desktop Assessment of Illicit Discharge Potential (Table 9 in WQCR) to better prioritize areas for IDDE screening activities</li> </ul>	<ul style="list-style-type: none"> <li>Review and revise IDDE Plan in first year of permit term</li> <li>Conduct dry weather screening until 100% screened by end of permit term</li> <li>Conduct screening of all non-stormwater discharges until discharge is eliminated or determined to be uncontaminated</li> </ul>	<ul style="list-style-type: none"> <li>January 2023 (review/update)</li> <li>Implementation throughout permit term</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> </ul>
<b>Stormwater System Mapping</b> (4.4(d)) (4.4(e)) (4.4(f))	<ul style="list-style-type: none"> <li>Identify priority areas based on land use, prior history, and frequency of discharges</li> <li>Enhance existing maps with information collected during dry-weather screening events, maintenance activities, etc.</li> <li>Add new outfalls and conveyance systems to the map for the appropriate jurisdiction per ordinance as-built requirements or new developments</li> </ul>	<ul style="list-style-type: none"> <li>Review and update map annually</li> <li>Identify priority areas within first year of permit term</li> </ul>	<ul style="list-style-type: none"> <li>January 2023 (identify priority areas)</li> <li>Review/update annually</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> </ul>

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking, and Programmatic Indicators	Timeline	Responsible Party
<b>IDDE Staff Training</b> (4.4(g))	<ul style="list-style-type: none"> <li>• Train appropriate staff members on investigation of illicit discharges or illicit connections to the stormwater conveyance system</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct annual refresher training to appropriate departments and staff</li> <li>• Document number of staff, number of events held, and the topics covered in each session</li> <li>• Review and revise manual/field binder</li> </ul>	<ul style="list-style-type: none"> <li>• July 2023</li> <li>• Annually</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> <li>• Relevant city employees</li> </ul>
<b>Annual Report</b> (4.4(i)) (4.4(k))	<ul style="list-style-type: none"> <li>• Assess the program annually</li> <li>• Report progress in an annual report to IDEM</li> </ul>	<ul style="list-style-type: none"> <li>• Assess program in conjunction with gathering data and compilation of the annual report</li> <li>• Include:               <ul style="list-style-type: none"> <li>• IDDE program updates</li> <li>• A summary of any storm sewer system mapping changes to the stormwater outfall and conveyance maps</li> <li>• Number of new MS4 outfalls mapped</li> <li>• Number and location of dry weather outfalls screened for illicit discharges</li> <li>• Number and location of illicit discharges detected</li> <li>• Number and location of illicit discharges eliminated</li> <li>• Number of illicit discharges and/or spills reported to the MS4 entity</li> <li>• Number of enforcement actions taken by the MS4 entity</li> </ul> </li> <li>• Submit annual report</li> </ul>	<ul style="list-style-type: none"> <li>• February 2023</li> <li>• February 2024</li> <li>• February 2025</li> <li>• February 2026</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> </ul>

### 3.2.4 Construction Site Stormwater Run-Off

The MS4GP requires the MS4 Operator to develop and administer an erosion and sediment control program which includes strategies to manage the overall program components, monitor compliance of program requirements, and if necessary, enforce any violations. Requirements also include the development of an ordinance or other regulatory mechanism and establishment of a construction program that controls polluted runoff from construction activities that disturb one or more acres of land in the MS4 area. This construction program must include a permitting process, erosion control plan review process, site inspections, and enforcement. The permitting process must include a requirement for the construction project site owner to submit a copy of the permit application directly to IDEM. MS4 entities must provide an opportunity for local SWCD to provide comments and recommendations to the MS4 operator on individual projects.

The construction program must include requirements for the implementation of appropriate BMPs on construction sites to control sediment, erosion, and other waste. MS4 entities must review and approve construction plans submitted by the construction site operator before construction activity commences. Procedures must be developed for site inspection and enforcement to ensure BMPs are properly installed. The procedures must include a means to identify priority sites for inspection and enforcement, as well as a means to receive and consider public inquiries, concerns, and information submitted regarding local construction activities. A tracking process must be implemented in which submitted public information is documented and then given to the appropriate staff for follow-up. Further MS4 personnel responsible for plan review, inspection, and enforcement of construction activities shall receive annual training.

**Table 11** in the next section provides a detailed description of the Construction and Post-Construction Site Stormwater Runoff Control BMPs to be implemented and identifies the measurable goals, progress indicators, timelines, priority areas, and responsible parties. Information such as which structural BMPs are allowed within new or redevelopment, BMP selection criteria, and the associated performance standards may be found in the Stormwater Ordinance and Technical Standards for the City of Westfield. These BMPs have been combined with the Post-Construction Site Stormwater Runoff Control BMPs (MCM #5) for ease of presentation and discussion.

### 3.2.5 Post-Construction Site Stormwater Run-Off

The MS4GP requires the development of an ordinance or other regulatory mechanism and establishment of a post-construction program that addresses runoff from new development and redevelopment areas that disturb one or more acres of land in the MS4 area. This program must include a permitting process, plan review process, site inspections, and enforcement. MS4 area personnel responsible for plan review, inspection, and enforcement of post-construction BMPs shall receive annual training.

Where appropriate, MS4 entities must use a combination of storage, infiltration, filtering, or vegetative practices to reduce the impact of pollutants in stormwater runoff on receiving waters in areas that are the responsibility of the MS4 entity. A written Operational and Maintenance (O&M) Plan must be developed and implemented for all existing stormwater structural BMPs, which are under the control of the MS4 entity. As new post-construction BMPs are added to areas under the control of the MS4 entity, the O&M Plan must be updated accordingly.

Compliance with this MCM requires MS4s to develop a program for managing Post-Construction Stormwater Runoff Control BMPs that will ensure adequate, long-term stormwater quality benefits in new development and redevelopment activities. Once construction is complete, post-construction practices specified by the MS4 must be implemented to ensure adequate stormwater quality is maintained from the developed site. Table 11 provides a summary of the Construction and Post-Construction Site Stormwater Runoff Control BMPs to be implemented and identifies the associated measurable goals, programmatic

indicators, timeline, priority areas and responsible parties. These BMPs have been combined with the Construction Site Stormwater Runoff Control BMPs (MCM #4) for ease of presentation and discussion

**Table 11: Construction and Post-Construction BMPs**

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking, and Programmatic Indicators	Timeline	Responsible Party
<b>Stormwater Management Ordinance</b>  (4.5(b)) (4.6(b)) (4.5(f)) (4.6(c))	<ul style="list-style-type: none"> <li>Review and revise the active construction and post-construction site ordinance language and stormwater technical standards to ensure compliance with the MS4GP and the CSGP</li> </ul>	<ul style="list-style-type: none"> <li>Continue to update and enforce the Stormwater Management Ordinance 05-30, Section 19-24 as needed</li> <li>Review and approve proposed new and redevelopment projects for compliance with the Stormwater Technical Standards</li> <li>Incorporate post-construction performance standards into the ordinance and/or technical standards</li> <li>Review at least once per permit term</li> </ul>	<ul style="list-style-type: none"> <li>January 2023 (review/update)</li> <li>Implementation throughout permit term</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> </ul>
<b>Plan Review and Permitting Procedures</b>  (4.5(c))	<ul style="list-style-type: none"> <li>Establish or review plan review and permitting procedures, internal processes, and timetables</li> </ul>	<ul style="list-style-type: none"> <li>Establish or review written procedures for plan review</li> <li>Develop or review forms, checklists</li> <li>Review and approve proposed new and redevelopment projects</li> <li>Review 100% of construction plans and inspect prioritized sites for compliance</li> </ul>	<ul style="list-style-type: none"> <li>January 2023 (review/update)</li> <li>Implementation throughout permit term</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> </ul>
<b>Inspection Procedures</b>  (4.5(d)) (4.6(e)) (4.6(f))	<ul style="list-style-type: none"> <li>Establish or review procedures and processes to inspect sites to ensure measures are installed and maintained</li> <li>Inspect 100% of all permitted construction sites with greater than one acre of disturbance</li> <li>Re-inspect and follow-up on prioritized sites having identified problem areas and/or concerns</li> <li>Complete active construction site and post-construction BMP inspection forms</li> </ul>	<ul style="list-style-type: none"> <li>Establish or review written procedures for inspections</li> <li>Develop or review forms, checklists</li> <li>Identify priority sites for inspections</li> <li>Conduct inspections in accordance with procedures</li> <li>Complete forms for active construction sites and post-construction BMPs inspected</li> </ul>	<ul style="list-style-type: none"> <li>January 2023 (review/update)</li> <li>Implementation throughout permit term</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> </ul>
<b>Enforcement Procedures</b>  (4.5(e))	<ul style="list-style-type: none"> <li>Establish or review procedures and policies to enforce local ordinance</li> </ul>	<ul style="list-style-type: none"> <li>Establish or review written procedures to address violations, including compliance and escalating enforcement</li> </ul>	<ul style="list-style-type: none"> <li>January 2023 (review/update)</li> <li>Implementation throughout permit term</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> </ul>
<b>Public Reporting Program</b>  (4.5(g))	<ul style="list-style-type: none"> <li>Utilize program to field complaints from the public on illegal dumping, illicit discharges, poor erosion control practices, and other activities that negatively impact stormwater quality</li> </ul>	<ul style="list-style-type: none"> <li>Implement the pollution hotline program</li> <li>Respond to complaints and inquiries</li> <li>Document the number of complaints received and all follow up actions taken on reports</li> </ul>	<ul style="list-style-type: none"> <li>On-going</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> </ul>

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking, and Programmatic Indicators	Timeline	Responsible Party
<b>Staff Training</b> (4.5(j)) (4.6(i))	<ul style="list-style-type: none"> <li>• Train appropriate staff members on plan review, inspection, compliance, and enforcement</li> <li>• Utilize pre-construction meetings as a forum for training and discussions regarding relevant stormwater issues</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct annual refresher training to appropriate departments and staff</li> <li>• Provide relevant training to all staff involved in plan review, site inspection, and enforcement requirements for construction and post-construction MCMs</li> <li>• Document number of staff, number of events held, and the topics covered in each session</li> </ul>	<ul style="list-style-type: none"> <li>• Annually</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> <li>• Relevant city employees</li> </ul>
<b>Active Site Inventory</b> (4.5(l))	<ul style="list-style-type: none"> <li>• Maintain an inventory of all projects subject to the CSGP, the MS4GP, and owned or operated by the MS4</li> <li>• Track the status of construction projects, erosion and sediment control activities, and post-construction BMPs</li> <li>• Track violations, complaints, and public information requests</li> <li>• Digitize publicly owned structural BMPs</li> </ul>	<ul style="list-style-type: none"> <li>• Establish or revise tracking procedures</li> <li>• Establish or update digitized structural BMP maps</li> </ul>	<ul style="list-style-type: none"> <li>• January 2023 (review/update)</li> <li>• On-going</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> </ul>
<b>Operation &amp; Maintenance (O&amp;M) Manuals</b> (4.6(d))	<ul style="list-style-type: none"> <li>• Require O&amp;M manuals to be submitted for all privately owned post-construction BMPs identified as part of a project submittal package</li> <li>• Continue to maintain post-construction BMPs as specified in existing O&amp;M manuals</li> <li>• Develop educational material for post-construction BMP owners focusing on O&amp;M manual content and issues associated with O&amp;M</li> </ul>	<ul style="list-style-type: none"> <li>• Enforce ordinance requirements for O&amp;M plan submittal and plan contents for new BMPs</li> </ul>	<ul style="list-style-type: none"> <li>• As plans are submitted</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> </ul>
<b>CSGP Compliance</b> (4.5(k))	<ul style="list-style-type: none"> <li>• Ensure MS4 owned/operated projects are compliant with the CSGP</li> </ul>	<ul style="list-style-type: none"> <li>• Submit plans to SWCD</li> <li>• Comply with MS4 Stormwater Ordinance</li> <li>• Develop SOP which includes self-monitoring of projects</li> </ul>	<ul style="list-style-type: none"> <li>• On-going</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> </ul>

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking, and Programmatic Indicators	Timeline	Responsible Party
<p><b>Annual Report</b></p> <p>(4.5(i)) (4.5(m)) (4.6(h)) (4.6(j))</p>	<ul style="list-style-type: none"> <li>• Assess the program annually</li> <li>• Report progress in an annual report to IDEM</li> </ul>	<ul style="list-style-type: none"> <li>• Assess program in conjunction with gathering data and compilation of the annual report</li> <li>• Include: <ul style="list-style-type: none"> <li>• The number of construction projects owned and/or operated by the MS4 entity that are active at the time of submittal</li> <li>• The number of construction sites obtaining a MS4 entity-issued stormwater run-off permit or authorization to discharge</li> <li>• The number of construction sites inspection</li> <li>• The number and type of enforcement actions taken</li> <li>• The number of public information requests and/or complaints received</li> </ul> </li> <li>• Updates to the post-construction ordinance or regulatory mechanism</li> <li>• Number of sites requiring post-construction controls</li> <li>• Number, type, and location of structural measures installed</li> <li>• Number, type, and location of structural measures modified to function properly to improve water quality benefits</li> <li>• Number, type, and location of structural measures inspection to ensure each meets design requirements and/or are being maintained</li> <li>• Submit annual report</li> </ul>	<ul style="list-style-type: none"> <li>• February 2023</li> <li>• February 2024</li> <li>• February 2025</li> <li>• February 2026</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> </ul>



### 3.2.6 Municipal Operations Pollution Prevention and Good Housekeeping

The MS4GP requires the development and implementation of a program to prevent or reduce polluted runoff from municipal operations within the MS4 area. The program must include written documentation of maintenance activities, maintenance schedules, and long-term inspection procedures for BMPs to reduce floatables and other pollutants discharged from the separate storm sewers.

Controls must be implemented for reducing or eliminating the discharge of pollutants from operational areas, including roads, parking lots, maintenance and storage yards, and waste transfer stations. Written procedures must be developed and implemented for the proper disposal of waste or materials removed from separate storm sewer systems and operational areas. New flood management projects must be assessed via written documentation for their impacts on water quality and existing flood management projects must be examined for incorporation of additional water quality protection devices or practices. MS4 entity employees must be properly trained on various topics such as herbicide and insecticide application and the function of BMPs. Such training must be documented in writing.

**Table 12** provides a summary of the Pollution Prevention and Good Housekeeping BMPs to be implemented and identifies the associated measurable goals, programmatic indicators, environmental benefits, timeline, priority areas and responsible parties associated with each BMP. A detailed description of each BMP is provided below.



**Table 12: Pollution Prevention and Good Housekeeping BMPs**

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking, and Programmatic Indicators	Timeline	Responsible Party
<p><b>Stormwater Pollution Prevention Plans (SWPPPs)</b>  (4.7(b-f))</p>	<ul style="list-style-type: none"> <li>Evaluate listing of properties, lots, storage facilities, etc. owned or operated by the city</li> <li>Develop additional SWPPPs or SOPs if necessary</li> <li>Include facility inspection sheets, employee training form, spill documentation</li> <li>This general BMP covers specific BMPs such as:                             <ul style="list-style-type: none"> <li>Secondary containment</li> <li>Salt/sand management</li> <li>Snow disposal areas</li> <li>Spill prevention and clean up</li> <li>Fertilizer and pesticide management</li> <li>Waste disposal</li> <li>Wash water management</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Utilize SWPPP and sheets to track inspections, training, etc. for each facility</li> <li>Conduct and document quarterly facility inspections and assessments</li> </ul>	<ul style="list-style-type: none"> <li>Annually (review and revise)</li> <li>Quarterly (inspections)</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> <li>Public Works Department</li> <li>Parks Department</li> <li>Police/Fire Departments</li> </ul>
<p><b>Facility Inspections</b>  4.7(c) 4.7(f)</p>	<ul style="list-style-type: none"> <li>Assess existing operations at each MS4 owned and/or operated facility annually</li> <li>Conduct quarterly inspections at each facility and update records in SWPPP</li> </ul>	<ul style="list-style-type: none"> <li>Conduct and document quarterly facility inspections and assessments, at least one of which is conducted by the MS4 coordinator or a designated individual</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> <li>Public Works Department</li> <li>Parks Department</li> <li>Police/Fire Departments</li> </ul>
<p><b>Stormwater Infrastructure Maintenance</b>  (4.7(g))</p>	<ul style="list-style-type: none"> <li>Develop a written O&amp;M plan for MS4 owned and/or operated stormwater infrastructure</li> <li>Perform a surface visual inspection of all catch basins, outfalls, and conveyance systems</li> <li>Maintain the MS4 conveyance and associated structures included outfalls, open channels, and ditches</li> </ul>	<ul style="list-style-type: none"> <li>Implement a storm sewer system maintenance schedule and track activities to document the amount of pollution that has been kept out of local receiving waters as a result of the stormwater program</li> <li>Complete surface visual inspections of the entire system within the permit cycle with a minimum of 15% completed annually</li> <li>Document the amount of litter picked up as a result of periodic litter pickup events</li> <li>Document the amount of materials removed from the storm sewer system and disposal methods</li> <li>Document all improvements made to roadside shoulders and ditches</li> </ul>	<ul style="list-style-type: none"> <li>July 2023 (review/update)</li> <li>Implementation throughout permit term</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> <li>Public Works Department</li> </ul>

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking, and Programmatic Indicators	Timeline	Responsible Party
		<ul style="list-style-type: none"> <li>• Document all improvements made to stormwater outfalls</li> <li>• Document all issues noted during visual inspection</li> </ul>		
<b>Third Party Compliance</b> (4.7(j))	<ul style="list-style-type: none"> <li>• Establish or review procedures to ensure contractors or third-party entities hired by the MS4 entity are required to comply with stormwater good housekeeping</li> </ul>	<ul style="list-style-type: none"> <li>• Establish or review written procedures for compliance and enforcement</li> <li>• Document actions taken</li> </ul>	<ul style="list-style-type: none"> <li>• As needed</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> </ul>
<b>Flood Management Projects</b> (4.7(k)) (4.7(l))	<ul style="list-style-type: none"> <li>• As they are proposed, assess flood management projects for incorporation of water quality devices or practices</li> </ul>	<ul style="list-style-type: none"> <li>• Document that flood control projects are assessed for incorporation of additional water quality devices or practices</li> </ul>	<ul style="list-style-type: none"> <li>• As projects proposed</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> <li>• Engineering Department</li> <li>• Community Development</li> </ul>
<b>Staff Training</b> (4.7(m))	<ul style="list-style-type: none"> <li>• Train appropriate staff members on new technology, operations, fueling spill prevention and clean-up, other responsibilities that arise during the year, site specific stormwater run-off issues, and permit requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct annual refresher training to appropriate departments and staff</li> <li>• Train all new full-time employees within 60 days of date of employment</li> <li>• Train all new seasonal employees within 30 days of date of employment</li> <li>• Document number of staff, number of events held, and the topics covered in each session</li> </ul>	<ul style="list-style-type: none"> <li>• Annually</li> </ul>	<ul style="list-style-type: none"> <li>• Westfield MS4 staff</li> <li>• Public Works Department</li> <li>• Parks Department</li> </ul>

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking, and Programmatic Indicators	Timeline	Responsible Party
<p><b>Annual Report</b></p> <p>(4.7(i)) (4.7(n))</p>	<ul style="list-style-type: none"> <li>Assess the program annually</li> <li>Report progress in an annual report to IDEM</li> </ul>	<ul style="list-style-type: none"> <li>Assess program in conjunction with gathering data and compilation of the annual report</li> <li>Include: <ul style="list-style-type: none"> <li>Number and location of stormwater outfalls and conveyance systems that have been repaired</li> <li>Estimated amount of material collected from stormwater drainage system cleaning including the disposal methods utilized</li> <li>Estimated amount of materials collected from street sweeping, if applicable, including the disposal method utilized</li> <li>Number and location of de-icing salt and sand storage areas and methods used to minimize stormwater exposure</li> </ul> </li> <li>Submit annual report</li> </ul>	<ul style="list-style-type: none"> <li>February 2023</li> <li>February 2024</li> <li>February 2025</li> <li>February 2026</li> </ul>	<ul style="list-style-type: none"> <li>Westfield MS4 staff</li> </ul>



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## **APPENDIX 1: Programmatic Indicators**



MCM	Programmatic Indicator Permit Citation	Description
Public Education, Outreach, Participation & Involvement	4.3(h)(2)	A list of each public participation and outreach events and activities conducted, a description of the activity, an estimate of the number of attendees, and an assessment if the goals and objectives were met.
	4.3(h)(3)	The number and types of construction and/or post-construction stormwater training opportunities that were provided to contractors, developers and builders, property owners (commercial, industrial, residential, homeowner associations, and other targeted entities during the reporting period.
	4.3(h)(4)	Documentation that presentations were made to elected officials or boards.
	4.3(h)(5)	Describe each targeted audience selected and how they were reached during the reporting period and describe behavioral changes observed.
	4.3(h)(6)	A list of all public education materials used during the reporting period.
Illicit Discharge Detection & Elimination	4.4(k)(2)	IDDE program updates.
	4.4(k)(3)	A summary of any storm sewer system mapping changes to the stormwater outfall and conveyance maps.
	4.4(k)(4)	Number of new MS4 outfalls mapped.
	4.4(k)(5)	Number and location of dry weather outfalls screened for illicit discharges.
	4.4(k)(6)	Number and location of illicit discharges detected.
	4.4(k)(7)	Number and location of illicit discharges eliminated.
	4.4(k)(8)	Number of illicit discharges and/or spills reported to the MS4 entity.
Construction Site Stormwater Run-off	4.5(m)(2)	The number of construction projects owned and/or operated by the MS4 entity that are active at the time of submittal.
	4.5(m)(3)	The number of construction sites obtaining a MS4 entity-issued stormwater run-off permit or authorization to discharge.
	4.5(m)(4)	The number of construction sites inspected.
	4.5(m)(5)	The number and type of enforcement actions taken.
	4.5(m)(6)	The number of public information requests and/or complaints received.
Post-Construction Stormwater Run-off	4.6(j)(2)	Updates to the post-construction ordinance or regulatory mechanism.
	4.6(j)(3)	Number of sites requiring post-construction controls.
	4.6(j)(4)	Number, type, and location of structural measures installed.
	4.6(j)(5)	Number, type, and location of structural measures modified to function properly or improve water quality benefits.
	4.6(j)(6)	Number, type, and location of structural measures inspected to ensure each meets design requirements and/or are being maintained.

Municipal Operations Pollution Prevention & Good Housekeeping	4.7(n)(2)	Number and location of stormwater outfalls and conveyance systems that have been repaired.
	4.7(n)(3)	Estimated amount of material collected from stormwater drainage system cleaning including the disposal methods utilized.
	4.7(n)(4)	Estimated amount of material collected from street sweeping, if applicable, including the disposal methods utilized.
	4.7(n)(5)	Number and location of de-icing salt and sand storage areas and methods used to minimize stormwater exposure.

## **APPENDIX 2: Acronyms**

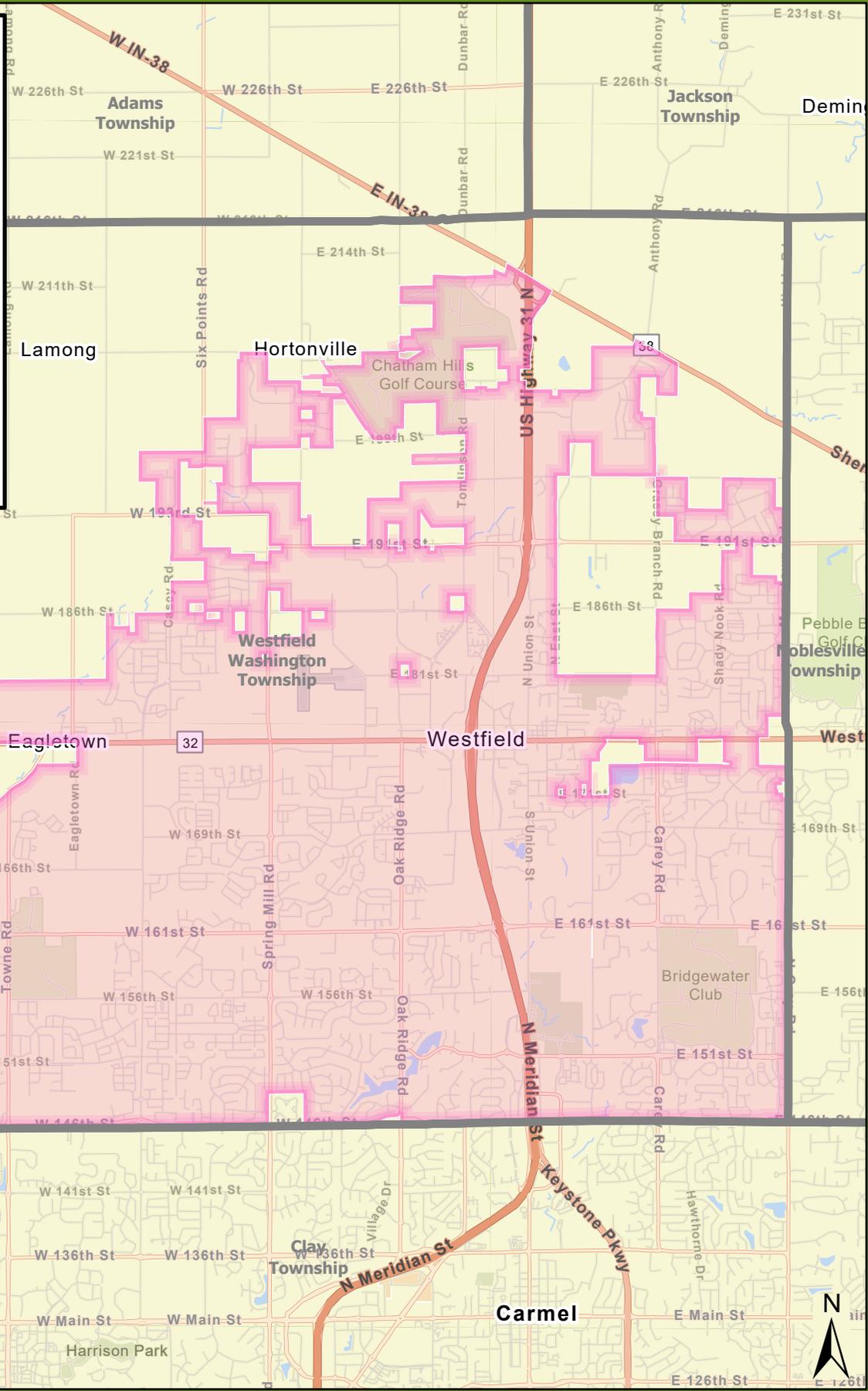


BMP	Best Management Practice
CBBEL	Christopher B. Burke Engineering, LLC
CSGP	Construction Stormwater General Permit
CSO	Combined Sewer Overflow
CWA	Clean Water Act
EI	Erodibility Index
EPA	Environmental Protection Agency
GIS	Geographical Information System
HEL	Highly Erodible Land
HHW	Household Hazardous Waste
HUA	Hydrologic Unit Area
HUC	Hydrologic Unit Code
IAC	Indiana Administrative Code
IBC	Impaired Biotic Communities
IDDE	Illicit Discharge Detection and Elimination
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
IDP	Illicit Discharge Potential
IR	Integrated Water Monitoring and Assessment Report
LARE	Lake and River Enhancement Program
LTCP	Long Term Control Plan
MCM	Minimum Control Measure
MS4	Municipal Separate Storm Sewer System
MS4GP	Municipal Separate Storm Sewer System General Permit
NLCD	National Land Cover Dataset
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
O&M	Operation & Maintenance Manual/Plan
OSRW	Outstanding State Resource Waters
PCB	Polychlorinated biphenyls
PHEL	Potentially Highly Erodible Land
PI	Programmatic Indicators
PWS	Public Water Supplies
SDWA	Safe Drinking Water Act
SIC	Standard Identification Classification
SOP	Standard Operating Procedure
SR CER	Stream Reach Characterization and Evaluation Report
SWCD	Soil and Water Conservation District
SWMD	Solid Waste Management District
SWPPP	Stormwater Pollution Prevention Plan
SWQMP	Stormwater Quality Management Plan
TMDL	Total Maximum Daily Load
USGS	United States Geological Survey
WHPA	Wellhead Protection Area
WMP	Watershed Management Plan
WQCR	Water Quality Characterization Report
WQS	Water Quality Standards
WWTP	Wastewater Treatment Plant



## **APPENDIX 3: Exhibits**





 MS4 Boundary  
 Township Boundary

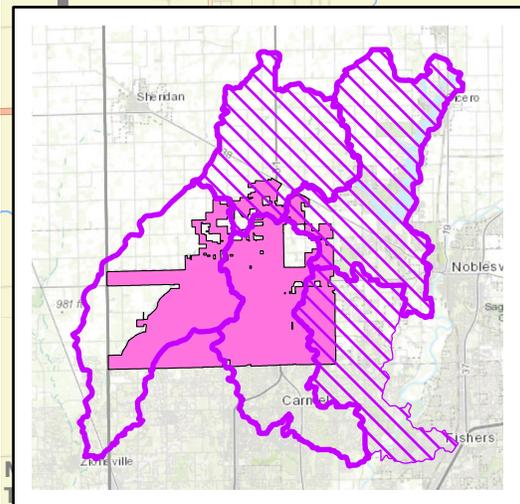



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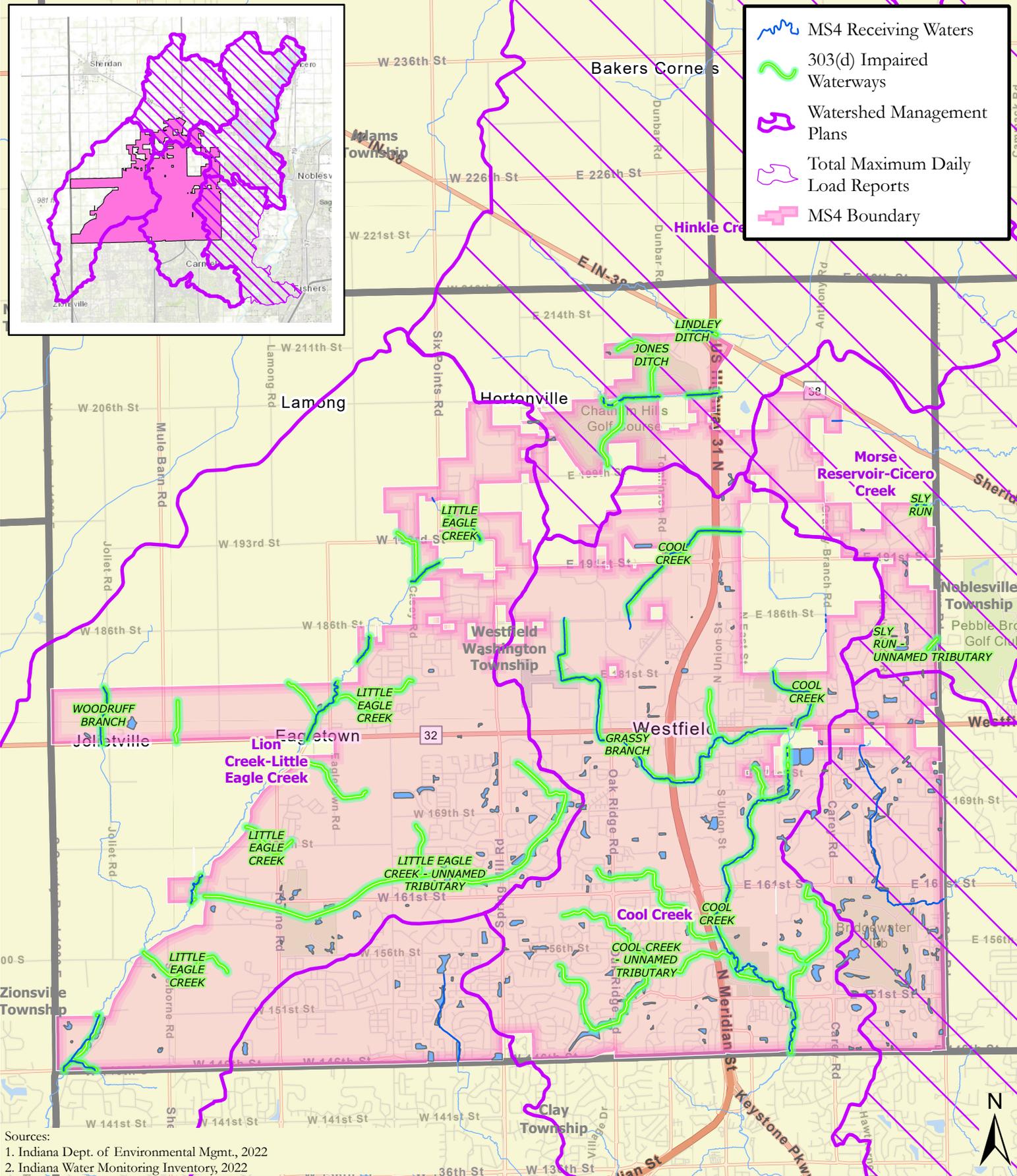
PROJECT:	MS4 Stormwater Quality Management Plan City of Westfield, Indiana
TITLE:	MS4 Boundary

PROJECT NO.	17-0495
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APPROX SCALE:	1" = 6,000'
DATE:	01/2023
EXHIBIT:	1



-  MS4 Receiving Waters
-  303(d) Impaired Waterways
-  Watershed Management Plans
-  Total Maximum Daily Load Reports
-  MS4 Boundary



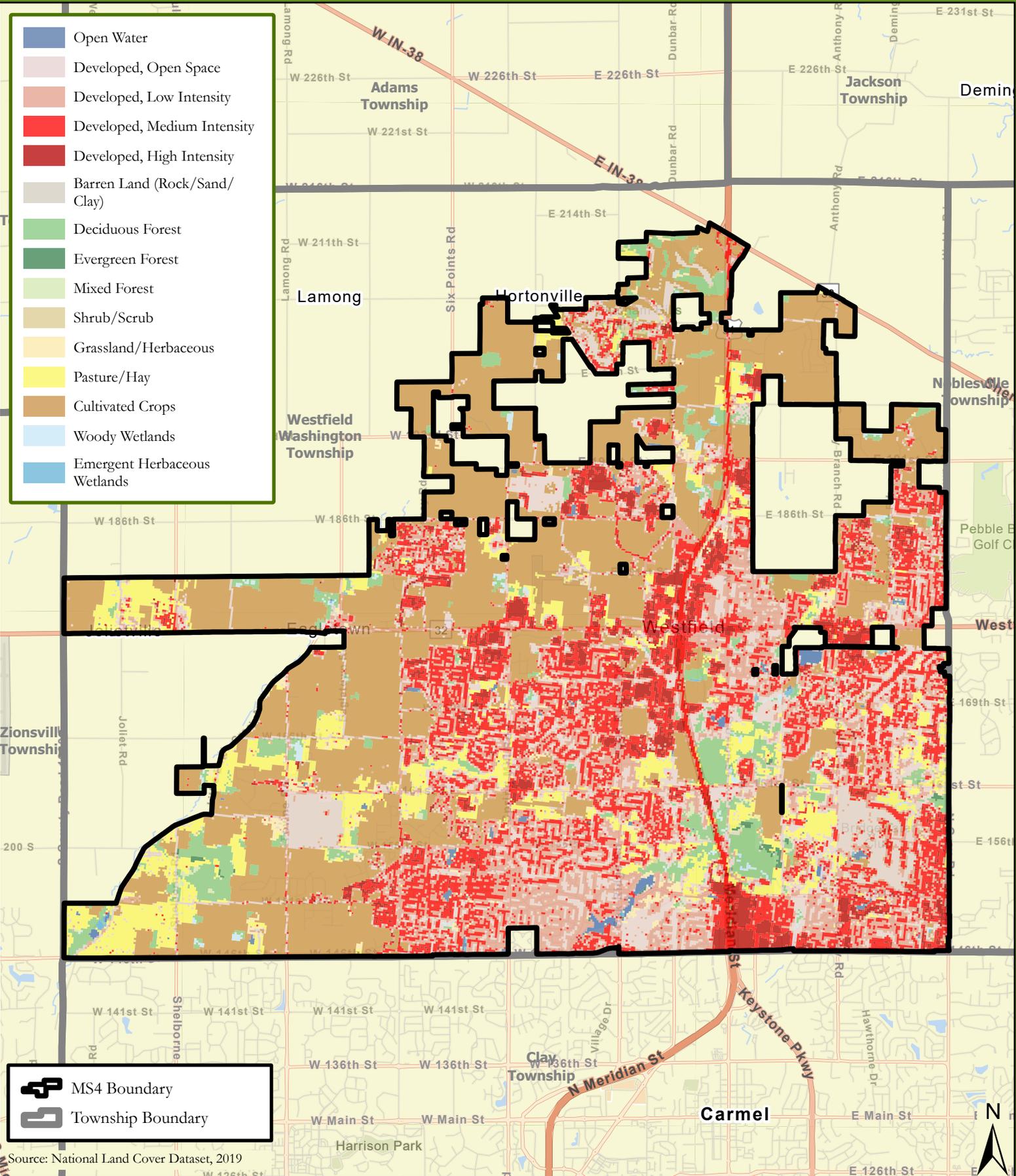
Sources:  
 1. Indiana Dept. of Environmental Mgmt., 2022  
 2. Indiana Water Monitoring Inventory, 2022

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PROJECT:	MS4 Stormwater Quality Management Plan City of Westfield, Indiana
TITLE:	Water Quality

PROJECT NO.	17-0495
APPROX SCALE:	1" = 6,000'
DATE:	01/2023
EXHIBIT:	2

-  Open Water
-  Developed, Open Space
-  Developed, Low Intensity
-  Developed, Medium Intensity
-  Developed, High Intensity
-  Barren Land (Rock/Sand/Clay)
-  Deciduous Forest
-  Evergreen Forest
-  Mixed Forest
-  Shrub/Scrub
-  Grassland/Herbaceous
-  Pasture/Hay
-  Cultivated Crops
-  Woody Wetlands
-  Emergent Herbaceous Wetlands



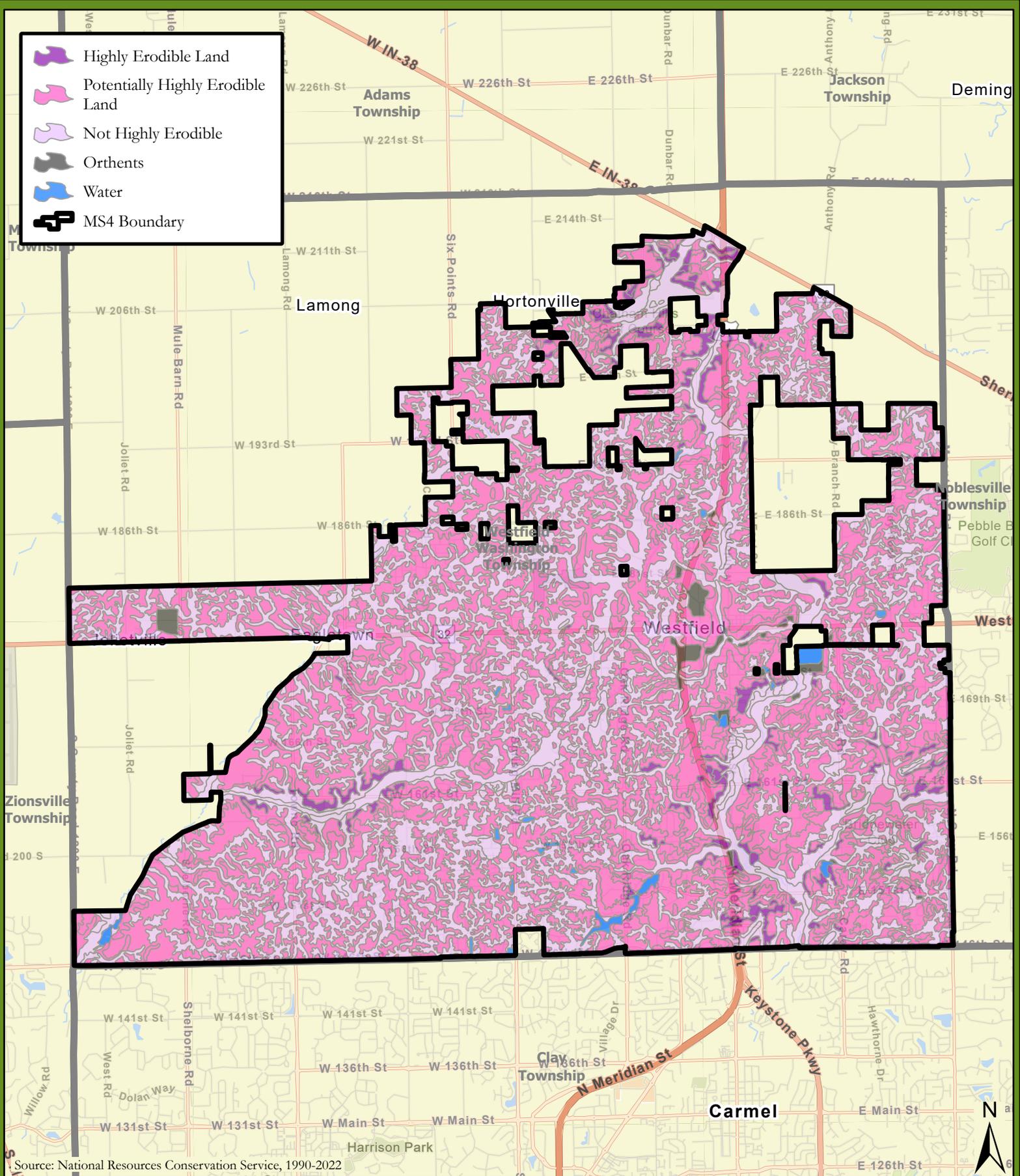
Source: National Land Cover Dataset, 2019

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PROJECT:	MS4 Stormwater Quality Management Plan City of Westfield, Indiana
TITLE:	Land Cover

PROJECT NO.	17-0495
APPROX SCALE:	1" = 6,000'
DATE:	01/2023
EXHIBIT:	3

-  Highly Erodible Land
-  Potentially Highly Erodible Land
-  Not Highly Erodible
-  Orthents
-  Water
-  MS4 Boundary



Source: National Resources Conservation Service, 1990-2022

 <p><b>Christopher B. Burke Engineering LLC</b>  PNC Center, Suite 1368 South  115 West Washington Street  Indianapolis, Indiana 46204  (t) 317.266.8000 <a href="http://www.cbbel-in.com">www.cbbel-in.com</a></p>	<b>PROJECT:</b> MS4 Stormwater Quality Management Plan City of Westfield, Indiana	<b>PROJECT NO.</b> 17-0495	<b>APPROX SCALE:</b> 1" = 6,000'
	<b>TITLE:</b> Highly Erodible Land	<b>DATE:</b> 01/2023	
	<b>EXHIBIT:</b> 4		