

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

JANUARY 2023

**Prepared for:**



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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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James Mueller, Mayor, City of South Bend  
MS4 Operator Printed Name Date

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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.

The City of South Bend, located in St. Joseph County (**Figure 1**) 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 applies 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 B and C.



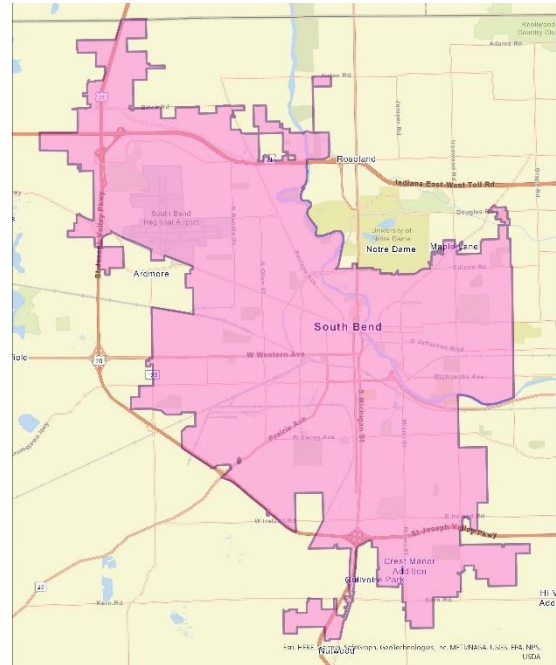
Figure 1: Location of South Bend, Indiana

## 1.1 CITY OF SOUTH BEND MS4 EXISTING CONDITIONS

The City of South Bend covers approximately 27,080 acres and the MS4 jurisdictional boundary mirrors the city boundaries (as of 2022) as identified on **Figure 2**. While located primarily in Portage Township, incorporated areas are also located within German Township, Centre Township, the western quadrant of Penn Township, the southern quadrant of Clay Township, and the northeastern quadrant of Warren Township.

The primary responsibilities for implementing requirements included in the MS4GP are held by the City of South Bend Public Works Department Engineering Division. Compliance, project permitting, and inspections are performed through oversight from this department. Maintenance of the city's infrastructure is handled through the City of South Bend Public Works Department.

South Bend is the largest municipality within St. Joseph County and accounts for approximately 38.0% of the county's population. The population of South Bend in 2020 was estimated to be 103,453, an increase of 2.3% since 2010.



**Figure 2: MS4 Boundary Map, City of South Bend**

## 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. They do not include combined sewer overflows and publicly owned treatment works.

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

## CHAPTER 2: WATER QUALITY CHARACTERIZATION REPORT

### REQUIREMENT MS4GP 3.1(a):

The water quality characterization report (WQCR) 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 WOCR 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 South Bend Land Cover**

Land Cover	Acres
Cultivated Crops	1,470.9
Developed, Low Intensity	6,929.3
Developed, Open Space	3,595.0
Developed, Medium Intensity	8,585.6
Developed, High Intensity	3,888.3
Barren Land (Rock/Sand/Clay)	73.1
Deciduous Forest	1,247.6
Evergreen Forest	4.2
Mixed Forest	13.0
Grassland/Herbaceous	105.4
Open Water	270.4
Emergent Herbaceous Wetlands	29.3
Woody Wetlands	464.6
Shrub/Scrub	32.0
Pasture/Hay	372.8
<b>TOTAL</b>	<b>27,081.5</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 shows potential for added development in the center of South Bend. In the western side of the City, continued development of heavy and light industrial areas is expected. Other areas for development include expanding neighborhoods around the city as low density and medium density zones.

## 2.2 MS4 OWNED AND OPERATED STRUCTURAL STORMWATER MANAGEMENT MEASURES

### REQUIREMENT MS4GP 3.1(c):

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

The structural stormwater management measures utilized by the City of South Bend include stormwater detention/retention ponds. The locations of the ponds are included within a hydrology shapefile managed by the City of South Bend GIS staff. The locations and conditions of the ponds are available upon request.

## 2.3 RECEIVING WATERS

### REQUIREMENT MS4GP 3.1(c):

The WQCR 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 2**. These waterbodies are also identified on **Exhibit 2**.

**Table 2: City of South Bend Receiving Waters**

Auten Ditch	Saint Joseph River
Bowman Creek	Pinhook Lake
Juday 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. 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 two 8-digit HUC watersheds; the Kankakee River Basin (HUC 07120001) and the St. Joseph River Basin (HUC 04050001). The 12-digit HUCs (based on 2022 MS4 boundaries) along with the acreages in the MS4 are listed in **Table 3**.

**Table 3: City of South Bend Watersheds**

12-digit HUC	Watershed Name	Watershed Acres Located in MS4
040500012205	Auten Ditch-Saint Joseph River	11106.7
071200010202	Chain-O-Lakes Ditch-Geyer Ditch	152.1
071200010205	Dixon West Place Ditch	590.4
040500012208	Dutch Corners-Saint Joseph River	590.4
040500012101	Grimes Ditch	48.0
040500012206	Juday Creek	272.8
040500012207	Pinhook Lake-Saint Joseph River	11813.8
040500012104	Rogers Ditch-Baugo Creek	40.1
040500012204	Willow Creek-Saint Joseph River	659.1

### 2.3.2 Integrated Waters Report

Section 303(d) of the CWA requires states to identify waters that do not currently or are not expected to meet the state’s water quality standards through implementation of technology-based standards. Within this section of the CWA, states must also prioritize these waters based on the designated uses of the water and the severity of the pollution. **Table 4** identifies the segments within the jurisdictional area for the City of South Bend that are listed on the Indiana 303(d) list of impaired waters.

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 stream’s 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 4** also identifies known impairments for HUAs within the South Bend MS4 area.

**Table 4: City of South Bend 303(d) Impaired Waters**

Segment ID	Waterbody Name	Impairment
INJ01M5_T1004	Bowman Creek (Coldwater)	<i>E. coli</i> , Recreational Use, Impaired Biotic Communities, Aquatic Life, PCBs in Fish Tissue, Fish Consumption
INJ01M6_02 INJ01M6_04	Juday Creek (Coldwater)	<i>E. coli</i> , Recreational Use, Impaired Biotic Communities, Aquatic Life
INJ01M7_T1002 INJ01M8_T1002 INJ01M5_05 INJ01M5_04 INJ01M5_03 INJ01M7_02 INJ01M7_03 INJ01M8_01	Saint Joseph River (Coldwater)	<i>E. coli</i> , Recreational Use, PCBs in Fish Tissue, Fish Consumption, Impaired Biotic Communities, Aquatic Life

### 2.3.3 Total Maximum Daily Loads (TMDLs)

The prioritized 303(d) list of impaired waters is used to compile a list of waters for which a Total Maximum Daily Load, or 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 5** identifies TMDLs relevant to the City of South Bend MS4

jurisdictional boundaries and the pollutant for which it was developed. More information regarding the TMDL program and TMDLs specific to the City of South Bend can be found in Section 2.5.2.

NOTE: While the Kankakee River is approximately 6.6 miles southwest of the corporate limits of the City of South Bend, Dixon Ditch is located within the corporate limits of the city on the far southwest side of the city. Since Dixon Ditch is a tributary to the Kankakee River, the Kankakee River TMDLs apply to land area within the city.

**Table 5: City of South Bend TMDLs**

Waterbody Name	TMDL Pollutant	Link to Report
St. Joseph River Watershed	<i>E. coli</i> TMDL	<a href="https://www.in.gov/idem/nps/resources/total-maximum-daily-load-reports/st-joseph-river-lake-michigan-watershed-tmdl/">https://www.in.gov/idem/nps/resources/total-maximum-daily-load-reports/st-joseph-river-lake-michigan-watershed-tmdl/</a>
Kankakee/Iroquois River Watershed	<i>E. coli</i> TMDL	<a href="https://www.in.gov/idem/nps/resources/total-maximum-daily-load-reports/kankakee/iroquois-watershed/">https://www.in.gov/idem/nps/resources/total-maximum-daily-load-reports/kankakee/iroquois-watershed/</a>

### 2.3.4 Wetlands

The 2021 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 2021 NWI, there are approximately 743.2 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

Recreational waters within the South Bend MS4 area include the following:

- **East Race:** A white water course attached to the St. Joseph River; begins just north of the Jefferson Bridge and exits back into the river just north of Madison Street.

- **Veterans Memorial Park Boat Launch:** Located on Northside Blvd just east of Twyckenham Drive.
- **Woodlawn Park:** A park along the St. Joseph River. Accessible from Riverside Drive and Oakwood Boulevard.
- **Keller Park Boat Launch:** Located on Riverside Drive just north of Beale Street and east of Sherman Ave.
- **Riverside Park Boat Launch:** Located on Riverside Drive just south of Darden Road.

## 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 Water 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 402 wells in St. Joseph County, 235 of which are active. Within the City of South Bend, there are two active non-community wells, one active community well, and seven inactive non-community wells.

The Indiana Department of Natural Resources (IDNR) Division of Water conducts resource assessments of ground water aquifers and maintains the records of over 400,000 water wells drilled in Indiana. A 2019 GIS Layer provided by the IDNR showed 14 wells within the South Bend MS4 area.

## 2.4.3 Wellhead Protection

The City of South Bend and Ivy Tech Community College-South Bend obtain drinking water from groundwater sources. South Bend maintains 32 deep wells located through the city to pump water for drinking water. To ensure that dangerous contaminants do not penetrate the soil and contaminate wells, the City of South Bend is covered by the Wellhead Protection Ordinance (County Code 24.24) as well as the Board of Health's Wellhead Protection Standards and Requirements. While Wellhead Protection Areas are sensitive in nature, they are not considered to be sensitive areas in the context of the City's Stormwater Program, as they are already managed through the existing Wellhead Protection Ordinance and the Standards and Requirements.

## 2.4.4 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. According to the IDNR, as of February 2022, there are 119 insects, 3 arachnids, 1 fish, 18 birds, 6 reptiles, 3 mammals, and 156 vascular plants listed as endangered, threatened, or rare within St. Joseph County. Additionally, the IDNR identifies Wet-mesic Floodplain Forest, Wet Floodplain Forests, Northwestern Morainal Dry Upland Forests, Northwestern Morainal Dry-mesic Upland Forests, Ponds, Dry-mesic Prairie, Mesic Prairie, Dry Sand Prairie, Dry-mesic Sand Prairie, Mesic Sand Prairie, Wet Sand Prairie, Wet-mesic Sand Prairie, Wet Prairie, Foredune, Mesic Savanna, Dry Sand Savanna, Dry-mesic Sand Savanna, Mesic Sand Savanna, Fen, Marsh, Sedge Meadow, Panne, and Shrub Swamp as High Quality Natural Communities on the listing noted above. Additionally,

Migratory Bird Concentration Areas are listed as a significant feature of St. Joseph 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 city will consider those locations to be sensitive areas and will update their stormwater program accordingly.

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

The federal CWA requires all states to develop, review, revise, and adopt Water Quality Standards (WQS). Water quality standards 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," the St. Joseph River and its tributaries in St. Joseph County (from the Twin Branch Dam in Mishawaka downstream to the Indiana/Michigan State Line) are listed as an exceptional use water.

#### 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 6** documents the HEL and Potentially HEL (PHEL) soils within St. Joseph County and therefore potentially throughout the MS4 area.

Recognizing the potential water quality impacts associated with soil erosion, the city 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 exist in City of South Bend ordinances that include limiting soil erosion into waterways and stormwater infrastructure.

**Table 6: City of South Bend Erodible Soils**

Map Unit Symbol	Soil Name	HEL Classification
ChC	Chelsea	HEL
HeC2, HeD2	Hillsdale	HEL
MeC2	Martinsville	HEL
MmB, MmC2, MoC3, MoD3	Miami	HEL
MrB2, MrC2, MsD3	Morkley	HEL
OsC2, OsD	Oshtemo	HEL
RtC2, RtD2	Riddles	HEL
TrC2	Tracy	HEL
TyC, TyD	Tyner	HEL

## 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 Report (SRCER)

According to Indiana’s Combined Sewer Overflow (CSO) Strategy, all CSO communities within the state were required to address the ninth minimum control measure (monitoring to effectively characterize CSO impacts) by conducting a Stream Reach Characterization and Evaluation study. The City of South Bend’s Stream Reach Characterization and Evaluation Report (SRCER) was completed and submitted to the IDEM in July 2003. In 1994 a control study was performed and wet weather monitoring and sampling reports indicated little or no impact on dissolved oxygen in the St. Joseph River from CSOs. However, large pulses in river bacteria counts (*E. coli* and fecal coliform) were observed during the storms. Between 1998 and 2002 additional sampling was conducted by the City of South Bend and the following results are noted within the SRCER:

- There were 9 exceedances of the *E. coli* water quality standard in dry weather.

The maximum *E. coli* concentration during wet weather occurred at Auten Bridge. There were also 3 samples from this location that were greater than 10,000 counts/100 mL.

Conclusions drawn from South Bend’s SRCER provide evidence that significant levels of *E. coli* and/or fecal coliform are originating from the 11 CSOs along the St. Joseph River (IDEM, 2022). The City of South Bend continues to work toward separating sewers and limiting CSP events.

### 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 were listed previously in Section 2.3.3 and are described further in the following paragraphs.

The IDEM finalized the TMDL development and published the Total Maximum Daily Load for *Escherichia coli* (*E. coli*) for the St. Joseph River, Elkhart and St. Joseph Counties in February of 2004. The report documents that there are over 80 Combined Sewer Overflow (CSO) outlets along the St. Joseph River, of which, 35 CSOs are located in the City of South Bend. Each of the communities with CSOs are required to complete Long Term Control Plans (LTCPs). It is anticipated that when those have been completed and implementation is occurring, the St. Joseph River may meet the *E. coli* WQS during wet weather events. The report also indicates that it is anticipated that implementation of MS4 permits will improve water quality and address stormwater impacts in the St. Joseph River.

Finalized in October 2009 the Total Maximum Daily Load Report for the Kankakee/Iroquois Watershed indicates that “Potential sources of *E. coli* and fecal coliform in the watershed include regulated point sources such as wastewater treatment plants, concentrated animal feeding operations, storm water runoff from Municipal Separate Storm Sewer Systems (MS4s); and illicitly connected “straight pipe” discharges of household waste. Point sources are regulated through the National Pollutant Discharge Elimination System (NPDES). Potential sources also include unregulated nonpoint sources such as runoff from agricultural fields, forests, and undeveloped areas; leaking or faulty septic systems; runoff from lawn fertilizer applications; pet waste; and storm water runoff from outside of MS4 communities.”

### **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 two of the most recent WMPs relevant to the City of South Bend waters and watersheds can be found in this section.

#### **St. Joseph River Watershed Management Plan (2005)**

The St. Joseph River Watershed is located in the southwest portion of the lower peninsula of Michigan and northwestern portion of Indiana and is the third largest river basin in Michigan. The watershed drains 4,685 square miles from 15 counties and includes 3,742 river miles. The 2005 St. Joseph River 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 St. Joseph River Watershed:

- Establish and sustain the financial and institutional capacity of a stakeholder group (e.g. steering committee, joint basin commission, watershed council, Friends of the St. Joe River Association) that assumes responsibility for coordinating implementation of the management plan and acts as the primary advocacy group, information clearinghouse, and planning partner for the watershed.
- Reduce soil erosion and sedimentation so that surface water functions and aesthetics are improved and protected.
- Reduce the amount of nutrient loading so that surface water functions and aesthetics are improved and protected.
- Increase cooperation, coordination, and collaboration among stakeholders (both governmental and nongovernmental) on a regular basis to eliminate program duplication, reduce costs, find more effective solutions, and maximize human, financial, and institutional resources.

- Increase preservation, restoration, protection, and appreciation of open space (a system of natural areas, natural systems, corridors, farmland, open land, and parklands).
- Eliminate/correct sources of disease-causing organisms that are harmful to public health and that limit the use of rivers, creeks, and lakes.
- Reduce the levels of pesticides, and other toxins that are harmful to public health and that degrade aquatic habitat.

### **Baugo Creek WMP (2004)**

The Baugo Creek Watershed is located in the St. Joseph River Sub-Basin (of Lake Michigan). North centrally located in Indiana, the watershed encompasses 49,851 acres in Elkhart and St. Joseph Counties. The 2004 Baugo 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 Baugo Creek Watershed. These goal statements included in the WMP are:

- Reduce discharge of *E. coli* to Werntz Ditch from pipes identified during the Town of Wakarusa Stream Characterization
- Reduce the potential contribution of *E. coli* entering the Baugo Creek-Wisler Ditch subwatershed from those locations identified during the MACOG stream-crossing evaluation that contained physical evidence of potential contamination-evidence of manure or sewage in water; or continuous discharge pipes with unknown sources.
- Reduce livestock access to waterbodies and potentially contaminated runoff from barnyards, pastures, and milk parlors through the installation of best management practices.
- Reduce potential runoff of nutrients and contaminants, reduce erosion and stabilize waterway banks, reduce the amount of sediment, and manage increased stormwater from entering waterbodies within the entire watershed through the installation of riparian filter strips.
- Support the Town of Wakarusa's Combined Sewer Overflow Long Range Plan as it strives to reduce the contribution of *E. coli* into Werntz Ditch.
- Seek a producer within the Baugo Creek-Wisler Ditch Watershed that along with development of a good livestock management plan, will install practices including but not limited to fencing of livestock from waterways, alternative livestock watering, filter strips around potential sources of *E. coli*, and/or riparian buffer strips.
- Develop a formal means to manage the Baugo Creek-Wisler Ditch Watershed Management Plan and insure achievement of identified water protection and improvement goals.

### **2.5.4 Lake and River Enhancement Projects**

The IDNR's Division of Fish and Wildlife aims to enhance aquatic habitat for fish and wildlife and ensure the continued viability of Indiana's publicly accessible lakes and streams through their Lake and River Enhancement Program (LARE). The program aims to accomplish this through measures that reduce non-point sediment and nutrient pollution of surface waters to a level that meets or surpasses state water quality standards. The LARE Program provides technical and financial assistance for qualifying projects and are divided into three categories of funding:

- Watershed Land Treatment, Biological and Engineering Projects
- Aquatic Vegetation Management
- Logjam and Sediment Removal

**Table 7** includes projects associated with the City of South Bend MS4 receiving waters that have received LARE funding since 2018.

**Table 7: LARE Projects within the South Bend MS4**

Waterbody	Funding Amount	Year	Project
St. Joseph River	\$100,000	2022-23	Logjam and Sediment Removal
Baugo Creek	\$56,200	2021-22	Watershed Land Treatment, Biological, and Engineering Projects
St. Joseph River	\$7,500	2021-22	Logjam and Sediment Removal
St. Joseph River	\$80,000	2020-21	Watershed Land Treatment, Biological, and Engineering Projects
St. Joseph River	\$40,000	2019-20	Watershed Land Treatment, Biological and Engineering Projects
St. Joseph River	\$45,000	2018-19	Watershed Land Treatment, Biological, and Engineering Projects

## 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 by city staff or through other means, 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 is aware of 444 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 important to note that IDEM is currently working on a replacement, master general permit for Rule 6.

### 2.6.3 Residential Septic Systems

Based upon a review of the NRCS Soil Survey Geographic Database, soils unsuitable for septic systems are common throughout the MS4 area. Existing City policy dictates that all new developments occurring within South Bend 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 St. Joseph County Health Department, if site conditions meet all applicable Indiana State Department of Health standards.

Sufficient controls are in place to address on-site wastewater treatment in developing and redeveloping areas. However, priority will be given to those areas within the MS4 area with known septic system failures or inadequacies.

## 2.6.4 Surface Visual Conveyance Inspection Findings

In compliance with the MS4GP Municipal Operation Pollution Prevention and Good Housekeeping Minimum Control Measure, MS4 entities are tasked with completing a visual inspection of catch basins, outfalls, and conveyance systems over the five-year permit term. Procedures and protocols have been developed for surface visual conveyance inspections of the city’s stormwater conveyance system with inspections to begin in 2023.

## 2.6.5 IDDE Findings

A community should understand the extent of water quality problems caused by illicit discharges. As complaints are received and/or IDDE screening brings impacts to light, the city will follow through on investigations and the mitigation of any problems. Additionally, desktop assessments will 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	Using publicly available water testing data, the frequency that individual samples of dry weather water quality exceed benchmark values for bacteria, nutrients, conductivity or other predetermined indicators will be evaluated. High risk if two or more exceedances are found in any given year.
Density of Generating Sites or Industrial NPDES Stormwater Permits	The location/density of Industrial NPDES Stormwater Permit holder sites will be evaluated for potential ‘hot spot’ areas with a high IDP.

## 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 prioritization of BMP maintenance and repairs over the current MS4GP permit cycle.

As the city plans for future growth and development, land use changes are anticipated within areas of the MS4. These areas include: residential development along the Northern and Southern boundaries of the City, with industrial development expanding along the western portion of the city. This growth can have impacts on the MS4 program as well as the water quality of receiving waters. Within the City of South Bend, parts of the St. Joseph River, parts of tributary waters to the St. Joseph River, and parts of tributary waters to the Kankakee River are known to have impairments and are 303(d) listed. The city will continue working to improve water quality in these waterbodies to meet State Water Quality standards through implementation of the MS4GP requirements.

## CHAPTER 3: STORMWATER QUALITY MANGEMENT 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 BOUNDARIES

The MS4 boundaries are identified on **Exhibit 1** while the specific Township, Range, and Section coverage is listed within **Table 9**. Boundaries will be updated as necessary following any future land purchases or acquisitions.

Table 9: MS4 Boundaries

Township	Range	Section
38 N	1 E	24
38 N	2 E	7, 8 14, 17,18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36
38 N	3 E	29, 31, 32
37 N	3 E	5, 6, 7, 8, 17, 18, 19, 20, 29, 30, 31, 32, 33
37 N	2 E	1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 21, 22, 23, 24, 25, 26, 27, 35, 36
36 N	2 E	1, 2, 3
36 N	3 E	6

### 3.2 MS4 ADMINISTRATION

While the MS4 program oversight will be provided by the Engineering 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 MCM tables in the following sections.

The City of South Bend participates in a regional approach to collaborate with other MS4 communities regarding the Public Education, Outreach, Participation and Involvement MCM. The Michiana Stormwater Partnership (MSP) has been the umbrella organization for the regional work group. Annually, the member MS4 communities review the long-term public education outreach and involvement plan and adjust the annual work plan accordingly. Each MS4 community is then responsible for their own local implementation of the resources developed.

### 3.3 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

#### 3.3.1 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.

#### 3.3.2 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 St. Joseph County Soil and Water Conservation District (SWCD) and the St. Joseph 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 10** 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 10: Public Education, Outreach, Participation, and Involvement BMPs**

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking and Programmatic Indicators	Timeline	Responsible Party
<b>Public Education and Involvement Plan</b> (4.3(a)(1))	Develop an annual/biennial/5-year stormwater education and involvement plan with community members of the Michiana Stormwater Partnership (MSP)  Utilize community issues identified	Plan developed with partner agency and department input by January 2023  Reviewed January 2024, January 2025, January 2026; revised as needed	<ul style="list-style-type: none"> <li>• January 2023</li> <li>• January 2024</li> <li>• January 2025</li> <li>• January 2026</li> </ul>	South Bend MS4 staff and community partners
<b>Identify three Community wide stormwater quality issues</b> (4.3(a)(2))	Develop list of three community wide stormwater issues to assist with education and involvement efforts	List developed in conjunction with public education and involvement plan  Revisit during annual review	<ul style="list-style-type: none"> <li>• January 2023: Issues Identified</li> <li>• January 2024</li> <li>• January 2025</li> <li>• January 2026</li> </ul>	South Bend MS4 staff and community partners
<b>Target Events Construction Residential Commercial/Industrial</b> (4.3(a)(2))	Develop or collaborate with existing efforts to highlight identified community wide stormwater issues at three events for target groups	Events will be decided in conjunction with the development and annual review of the education and involvement plan  Maintain a list of topics covered and constituents reached for each event	Events to be held:  Construction: Apr. 2023  Residential: June 2024  Commercial: Aug. 2025	South Bend MS4 staff and community partners
<b>Public Events</b> (4.3(a)(3))	Develop or collaborate with existing efforts to conduct two public events annually  Assist various groups with administering annual community clean-up events  Identify locations (common areas, stream segments, etc.) throughout City of South Bend to warrant such activities	Events and activities will be decided in conjunction with the development and annual review of the education and involvement plan  Events will be planned, advertised, and held throughout the year  Maintain a list of topics covered and constituents reached for each event	As scheduled throughout permit term	South Bend MS4 staff and community partners

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking and Programmatic Indicators	Timeline	Responsible Party
<p><b>Stormwater Educational Materials</b></p> <p>(4.3(a)(4)) (4.3(b))</p>	<p>Collaborate to develop, produce, or distribute printed materials related to stormwater issues</p> <p>Include information related to the three identified community issues</p> <p>Assist with larger efforts such as those similar to MS4 video production, workshops, etc.</p> <p>Develop 3 brochures addressing community issues identified</p>	<p>Materials and opportunities will be discussed during the development and annual review of the education and involvement plan</p> <p>Work in cooperation with partners to broaden exposure and present a unified message</p> <p>Maintain a list of materials developed, distributed, and utilized</p>	<ul style="list-style-type: none"> <li>• January 2023</li> <li>• January 2024</li> <li>• January 2025</li> <li>• January 2026</li> </ul>	<p>South Bend MS4 staff and community partners</p>
<p><b>Annual Training relevant to construction and post-construction</b></p> <p>(4.3(a)(5))</p>	<p>Develop or collaborate with existing efforts to conduct annual training for builders, developers, contractors, and engineers</p>	<p>Events will be decided in conjunction with the development and annual review of the education and involvement plan</p> <p>Maintain a list of topics covered and constituents reached for each event</p>	<ul style="list-style-type: none"> <li>• January 2023</li> <li>• January 2024</li> <li>• January 2025</li> <li>• January 2026</li> </ul>	<p>South Bend MS4 staff and community partners</p>
<p><b>Web Page</b></p> <p>(4.3(c))</p>	<p>Maintain the South Bend Stormwater web page regarding stormwater issues, and links to other sites.</p> <p>Add new Speakers Bureau information</p> <p>Include articles developed, brochures, and calendar updates</p> <p>Include Ordinances, applicable fees, and MS4 program information</p> <p>MSP Web-site links to all partner's sites and posts information on Facebook and Twitter</p>	<p>Review web page and update with new information annually</p> <p>Track total number of hits site receives each year</p> <p>Document all questions and comments received via the web page as well as the responses to them</p>	<ul style="list-style-type: none"> <li>• December 2023</li> <li>• December 2024</li> <li>• December 2025</li> <li>• December 2026</li> </ul>	<p>South Bend MS4 staff</p>

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking and Programmatic Indicators	Timeline	Responsible Party
<b>Elected Official Update</b> (4.3(e))	Report stormwater program updates to elected officials	Updates will be provided annually to the South Bend Common Council  Maintain a list of attendees and materials distributed	<ul style="list-style-type: none"> <li>• August 2023</li> <li>• August 2024</li> <li>• August 2025</li> <li>• August 2026</li> </ul>	South Bend MS4 staff
<b>Household Hazardous Waste (HHW) and Recycling Activities</b> (4.4(b)(4))	<ul style="list-style-type: none"> <li>• Encourage residents and staff to use existing HHW drop off for proper disposal</li> <li>• Encourage South Bend residents to participate in curbside 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>• Promote the Rays recycling program</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>	As scheduled throughout permit term	South Bend MS4 staff and community partners
<b>Public Reporting Program</b> (4.4(b)(6))	Utilize Community Hotline program to field complaints from the public on illegal dumping, illicit discharges, poor erosion control practices, and other activities that negatively impact stormwater quality	<ul style="list-style-type: none"> <li>• Implement the pollution hotline program</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>	On-going	South Bend MS4 staff

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>	<p>South Bend MS4 staff and community partners</p>

### 3.3.3 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 11** 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 11: 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 Ordinance documents 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> <li></li> </ul>	<ul style="list-style-type: none"> <li>Draft by December 2023</li> <li>Approved by June 2024</li> </ul>	MS4 Staff and MS4 Consultant
<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 within their jurisdictions</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> </ul>	<ul style="list-style-type: none"> <li>Reviewed/ updated: March 2023</li> <li>Implementation: throughout permit term</li> </ul>	MS4 Staff
<b>Stormwater System Mapping</b> (4.4(d)) (4.4(e)) (4.4(f))	<ul style="list-style-type: none"> <li>Add new outfalls and conveyance systems to the map for the appropriate jurisdiction per ordinance as-built requirements or new developments</li> <li>Identify priority areas based on land use, prior history, and frequency of discharges</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>Reviewed/ updated: annually</li> <li>Priority Areas: May 2023</li> </ul>	MS4 Staff
<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> </ul>	<ul style="list-style-type: none"> <li>April 2023</li> <li>March 2024</li> <li>March 2025</li> <li>March 2026</li> </ul>	MS4 Staff and MS4 Consultant
<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> </ul> </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>	MS4 Staff and MS4 Consultant

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking, and Programmatic Indicators	Timeline	Responsible Party
		<ul style="list-style-type: none"> <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> <li>• Submit annual report</li> </ul>		

### 3.3.4 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 12** 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 South Bend. These BMPs have been combined with the Post-Construction Site Stormwater Runoff Control BMPs (MCM #5) for ease of presentation and discussion.

### 3.3.5 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 12** 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 12: 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))	Review and revise Ordinance language to ensure compliance with the MS4GP and the CSGP.	Review at least once per permit term.	<ul style="list-style-type: none"> <li>• Draft by December 2023</li> <li>• Approved by June 2024</li> </ul>	MS4 Staff and MS4 Consultant
<b>Plan Review and Permitting Procedures</b>  (4.5(c))	Establish or review plan review and permitting procedures, internal processes, and timetables	<ul style="list-style-type: none"> <li>• Establish or review written procedures for plan review</li> <li>• Develop or review forms, checklists</li> </ul>	<ul style="list-style-type: none"> <li>• March 2023</li> <li>• Implementation: throughout permit term</li> </ul>	MS4 Staff
<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>• Continue inspecting 100% of all active construction sites</li> <li>• Continue to re-inspect and follow-up on sites having identified problem areas and/or concerns</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> </ul>	<ul style="list-style-type: none"> <li>• March 2023: Updated procedures</li> <li>• On-Going: Site inspections</li> </ul>	MS4 Staff
<b>Enforcement Procedures</b>  (4.5(e))	Establish or review procedures and policies to enforce local ordinance or regulatory mechanism	Establish or review written procedures to address violations, including compliance and escalating enforcement	<ul style="list-style-type: none"> <li>• March 2023: Updated procedures</li> <li>• On-Going: Site inspections</li> </ul>	MS4 Staff
<b>Stormwater Technical Standards</b>  (4.5(f)) (4.6(c))	Review the active construction and post-construction site language contained in the Stormwater Technical Standards	<ul style="list-style-type: none"> <li>• Incorporate post-construction performance standards into the Ordinance and/or Technical Standards</li> <li>• Review and approve proposed new and redevelopment projects for compliance with the Stormwater Technical Standards</li> </ul>	<ul style="list-style-type: none"> <li>• Draft by December 2023</li> <li>• Approved by June 2024</li> </ul>	MS4 Staff and MS4 Consultant
<b>Public Reporting Program</b>  (4.5(g))	Utilize the City of South Bend 311 citizen reporting program to field complaints from the public on illegal dumping, illicit discharges, poor erosion control practices, and other activities that negatively impact stormwater quality	<ul style="list-style-type: none"> <li>• Utilize the city’s existing citizen complaint reporting 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>	On-going	MS4 Staff

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))	Train appropriate staff members on plan review, inspection, compliance, and enforcement	Conduct annual refresher training to appropriate departments and staff  Document number of staff, number of events held, and the topics covered in each session	<ul style="list-style-type: none"> <li>• April 2023</li> <li>• March 2024</li> <li>• March 2025</li> <li>• March 2026</li> </ul>	MS4 Staff and MS4 Consultant
<b>Active Site Inventory</b>  (4.5(l))	Maintain an inventory of all projects subject to the CSGP, the MS4GP, and owned or operated by the MS4	Continually add projects as they are implemented	On-going	MS4 Staff
<b>Operation &amp; Maintenance (O&amp;M) Manuals</b>  (4.6(d))	Require O&M manuals to be submitted for all post-construction BMPs identified as part of a project submittal package	Enforce ordinance requirements for O&M plan submittal and plan contents for new BMPs	As plans are submitted	MS4 Staff
<b>CSGP Compliance</b>  (4.5(k))	Ensure MS4 owned/operated projects are compliant with the CSGP	<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>	On-going	MS4 Staff

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking, and Programmatic Indicators	Timeline	Responsible Party
<b>Annual Report</b> (4.5(i)) (4.5(m)) (4.6(h)) (4.6(j))	Assess the program annually Report progress in an annual report to IDEM	Assess program in conjunction with gathering data and compilation of the annual report Include: The number of construction projects owned and/or operated by the MS4 entity that are active at the time of submittal The number of construction sites obtaining a MS4 entity-issued stormwater run-off permit or authorization to discharge The number of construction sites inspection The number and type of enforcement actions taken The number of public information requests and/or complaints received Updates to the post-construction ordinance or regulatory mechanism Number of sites requiring post-construction controls Number, type, and location of structural measures installed Number, type, and location of structural measures modified to function properly to improve water quality benefits Number, type, and location of structural measures inspection to ensure each meets design requirements and/or are being maintained Submit annual report	February 2023 February 2024 February 2025 February 2026	
<b>Post-Construction BMP Tracking Database</b>	Continue tracking the status of post-construction BMPs	Continually add projects as they are implemented	On-going	MS4 Staff

### 3.3.6 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 MS4's 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 13** 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 13: 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 owned or operated by the MS4</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 forms to track inspections, training, etc. for each facility</li> <li>• Conduct and document quarterly facility inspections and assessments</li> </ul>	<p>Annual Review and revise</p> <p>Quarterly inspections</p>	<p>MS4 Staff</p>
<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>• A visual inspection of all catch basins, outfalls, and conveyance systems</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>• 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> <li>• Document all improvements made to stormwater outfalls</li> <li>• Document all issues noted during visual inspection</li> </ul>	<ul style="list-style-type: none"> <li>• March 2023: Updated procedures</li> <li>• Implementation: throughout permit term</li> </ul>	<p>MS4 Staff</p>

Best Management Practice (BMP)	BMP Description	Measurable Goals, Tracking, and Programmatic Indicators	Timeline	Responsible Party
<b>Third Party Compliance</b> (4.7(j))	Establish or review procedures to ensure contractors or third-party entities hired by the MS4 entity are required to comply with stormwater good housekeeping	<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>• March 2023: Updated procedures</li> <li>• On-going implementation</li> </ul>	MS4 Staff
<b>Flood Management Projects</b> (4.7(k)) (4.7(l))	Assess flood management projects for incorporation of water quality devices or practices	Document that flood control projects are assessed for incorporation of additional water quality devices or practices	As projects are proposed	MS4 Staff
<b>Staff Training</b> (4.7(m))	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	Conduct annual refresher training to appropriate departments and staff Train all new full-time employees within 60 days of date of employment Train all new seasonal employees within 30 days of date of employment Document number of staff, number of events held, and the topics covered in each session	On-going	MS4 Staff and MS4 Consultant
<b>Street Sweeping Program</b>	Continue to maintain regularly scheduled street and parking lot sweeping and/or vacuuming operations	Review/update procedures	<ul style="list-style-type: none"> <li>• March 2023: Updated procedures</li> <li>• On-going implementation</li> </ul>	MS4 Staff

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

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## **APPENDIX 1: Programmatic Indicators**

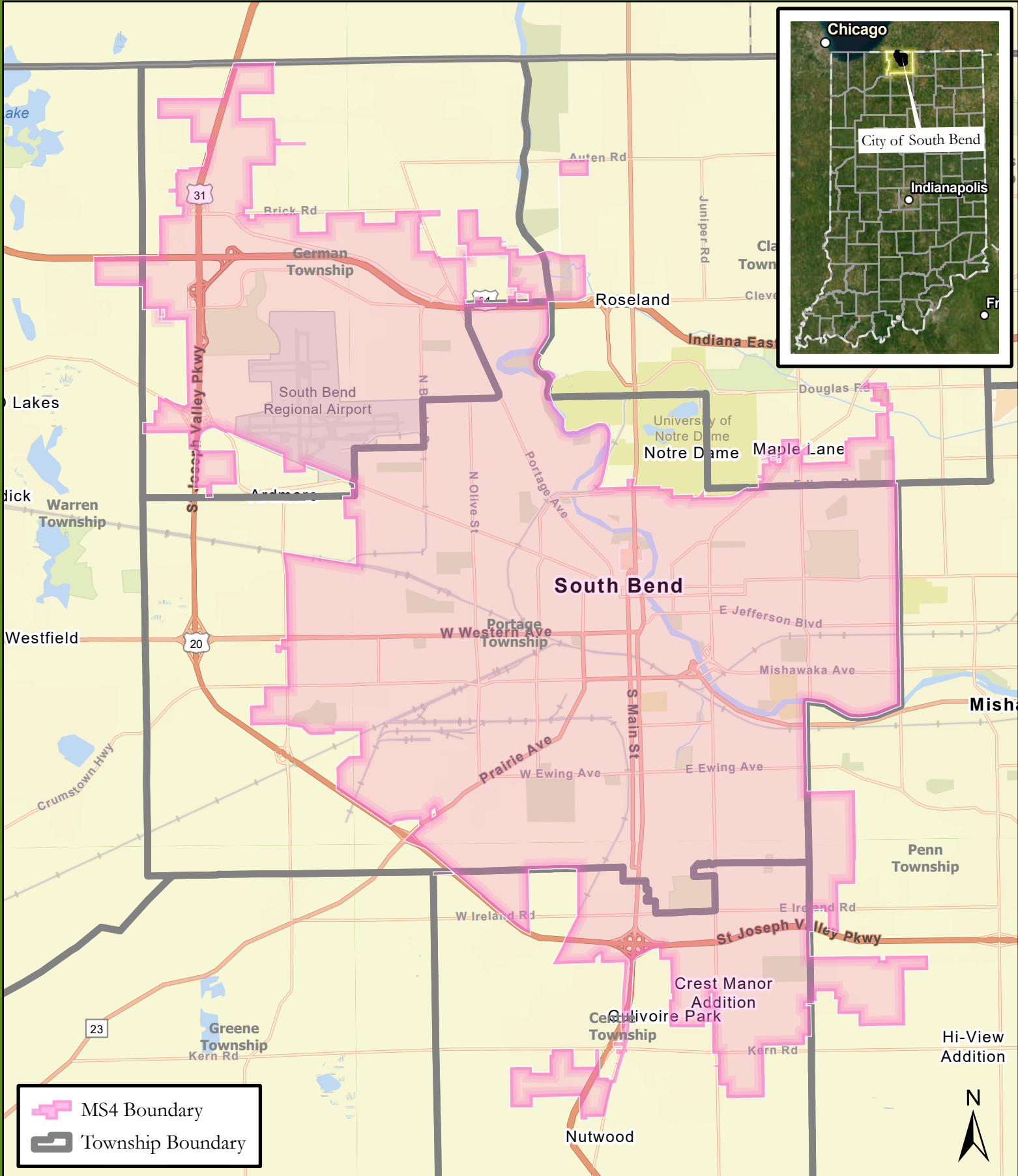
MCM	Programmatic Indicator Permit Citation	Description
Public Education, Outreach, Participation & Involvement MCM	4.3(h)(2)	A list of each public participation and outreach events and activities conducted, a description of the activity, an estimate of the number of attendees, and an assessment if the 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 MCM	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 MCM	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 MCM	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 MCM	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
SRCER	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

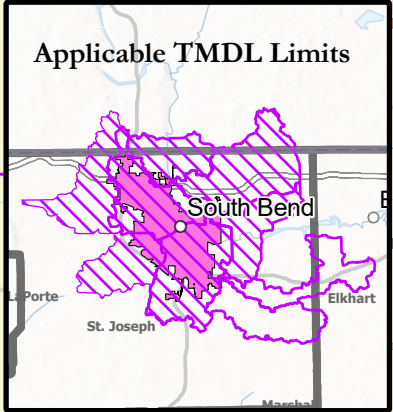
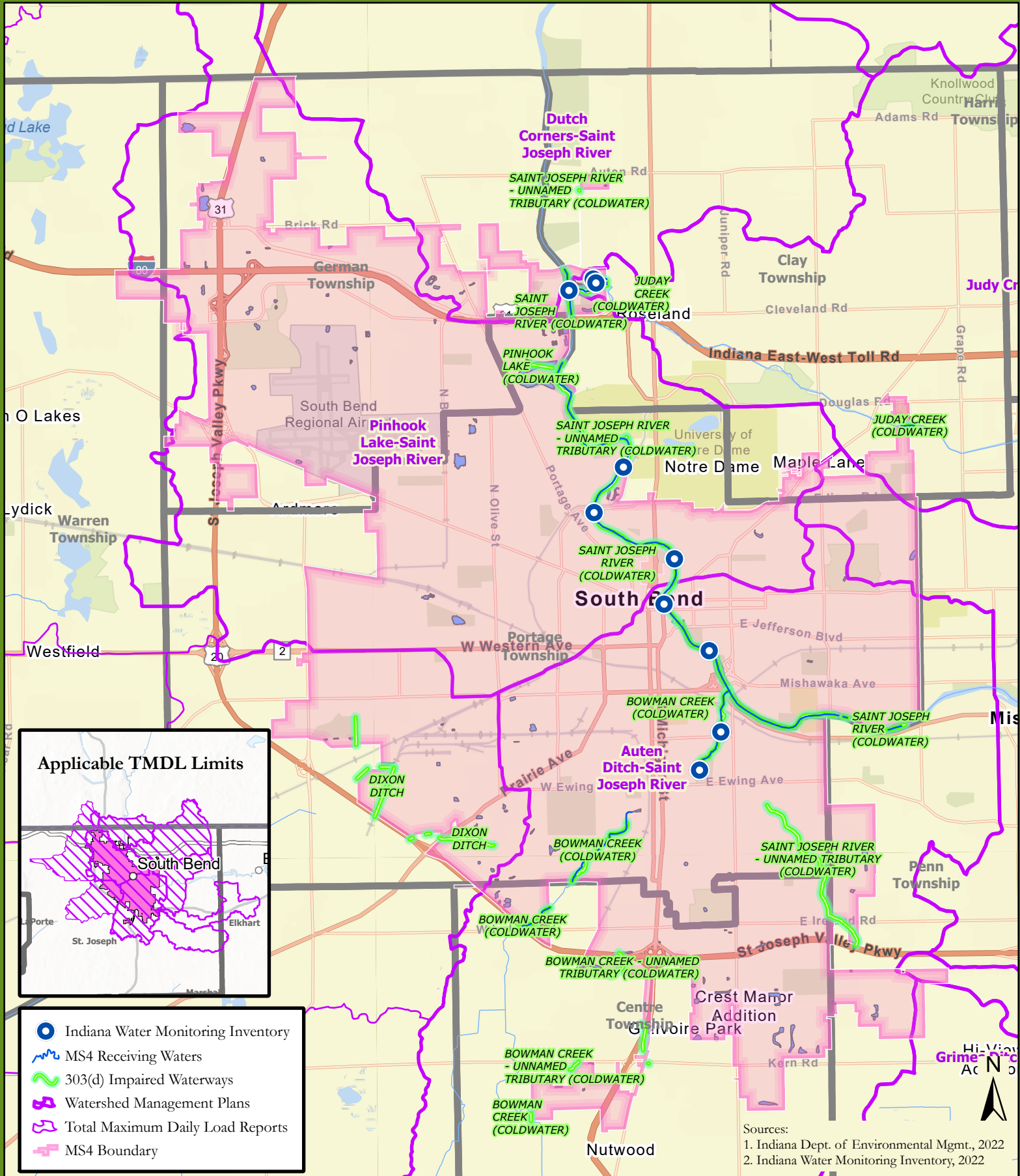



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PROJECT:	MS4 Stormwater Quality Management Plan City of South Bend, Indiana
TITLE:	MS4 Boundary

PROJECT NO.	12-0332
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APPROX SCALE:	1" = 7,000'
DATE:	08/2022
EXHIBIT:	1



- Indiana Water Monitoring Inventory
- ~ 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 South Bend, Indiana

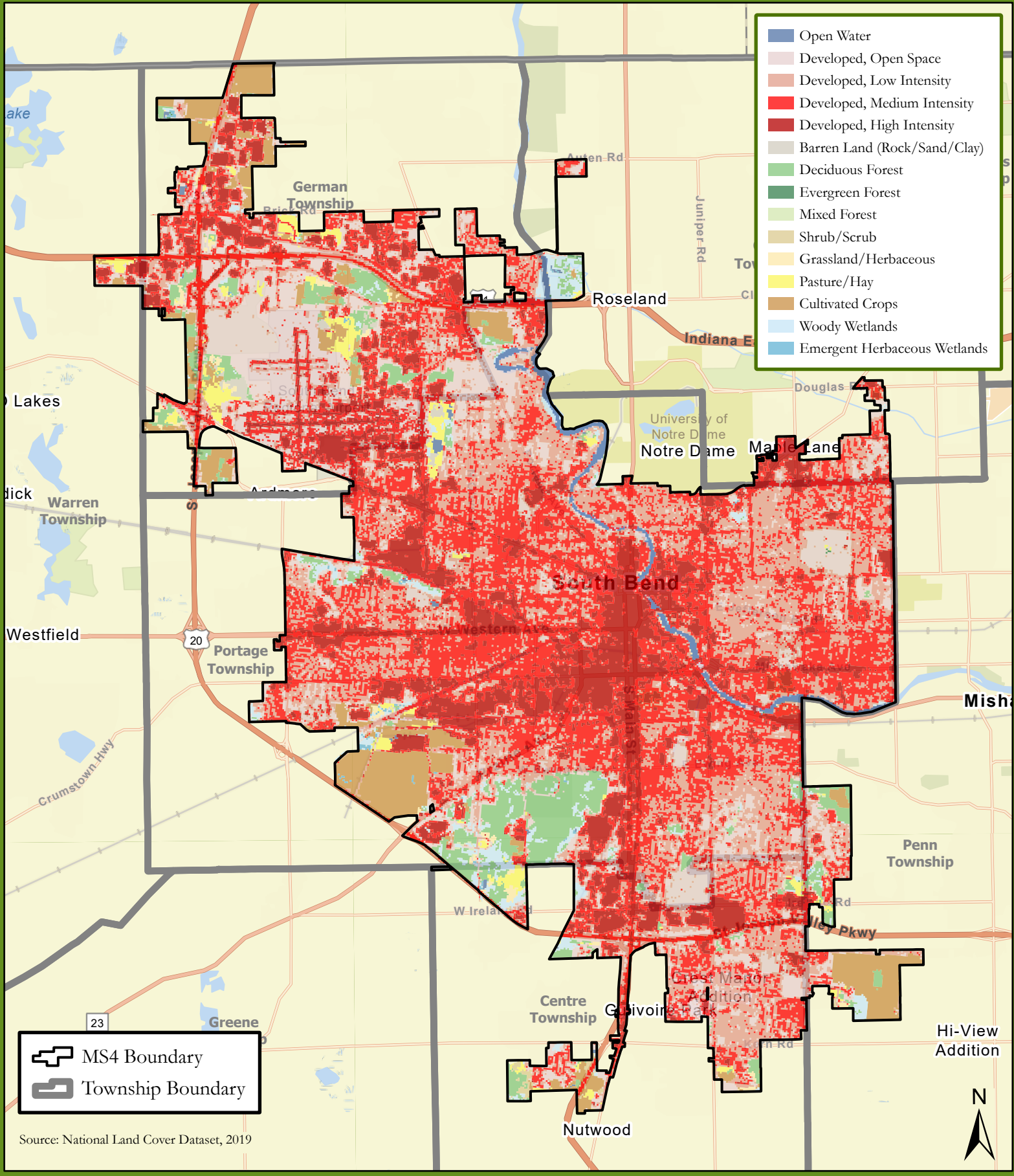
**TITLE:** Water Quality

**PROJECT NO.**  
 12-0332



**APPROX SCALE:**  
 1" = 7,000'

**DATE:**  
 08/2022

**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

 MS4 Boundary  
 Township Boundary

Source: National Land Cover Dataset, 2019



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	<b>TITLE:</b> Land Cover	<b>DATE:</b> 08/2022	
			<b>EXHIBIT:</b> 3