



## Shingle Creek and West Mississippi Watershed Management Commissions

## Fourth Generation Watershed Management Plan

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# Executive Summary

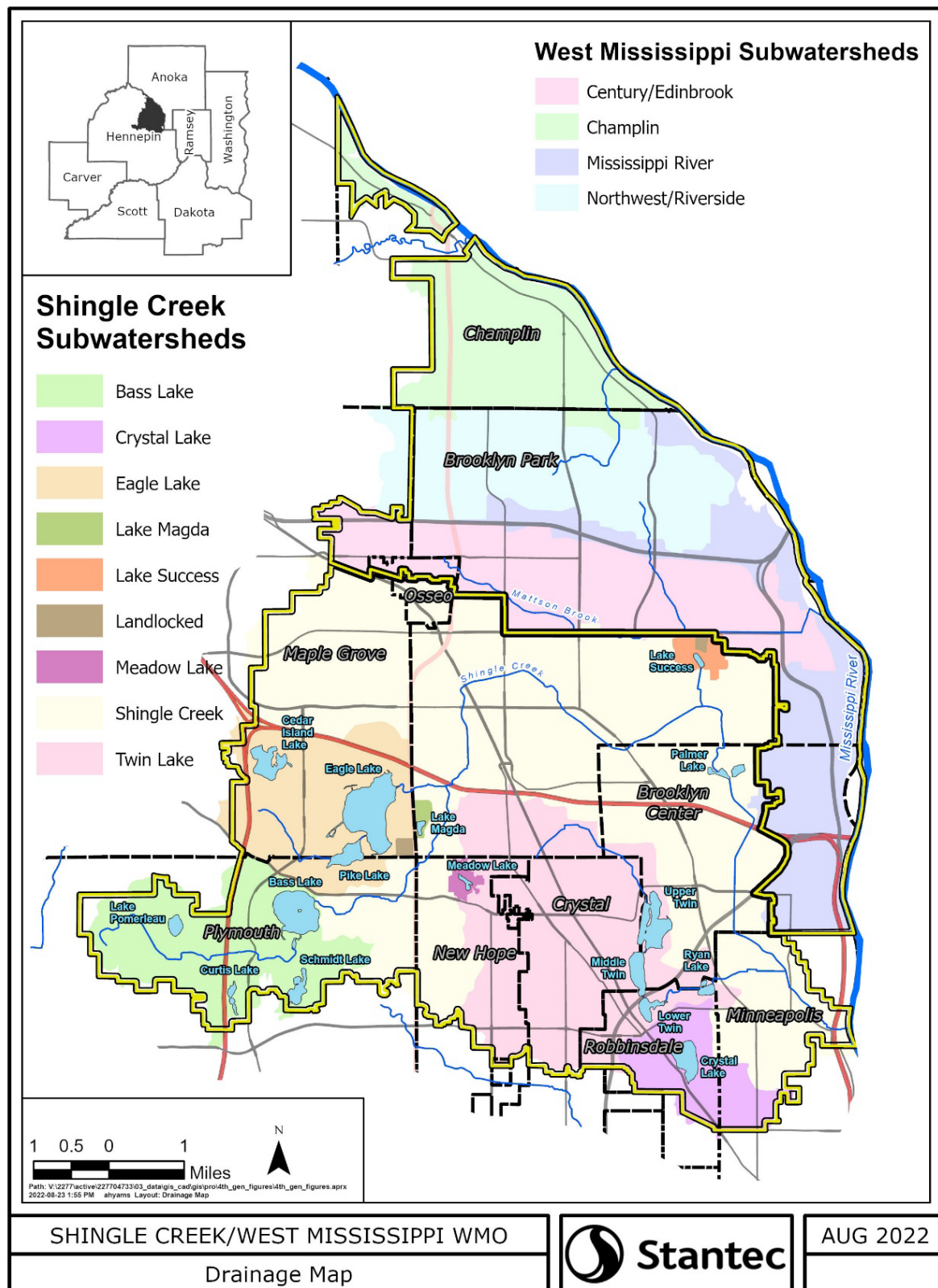


Figure 1-1. Overview of the Shingle Creek and West Mississippi Watersheds.

# Executive Summary

## The Watersheds

This watershed management plan describes how the Shingle Creek and West Mississippi Watershed Management Commissions (SCWM WMC) will manage activities in the two watersheds in the ten-year period 2023-2032.

The Shingle Creek Watershed Management Commission and the West Mississippi Watershed Management Commission are Watershed Management Organizations (WMOs) formed in 1984 using Joint Powers Agreements developed under authority conferred to the member communities by Minnesota Statutes 471.59 and 103B.201 through 103B.251. The watersheds are in the northwest portion of the Minneapolis-St. Paul seven county Metropolitan Area and are comprised of all or part of the following ten cities in Hennepin County (Figure 1-1):

Shingle Creek Watershed		West Mississippi Watershed		Combined
Cities	Area (sq mi)	Cities	Area (sq mi)	Area (sq mi)
Brooklyn Center	5.89	Brooklyn Center	2.47	8.36
Brooklyn Park	11.15	Brooklyn Park	14.20	25.35
		Champlin	5.12	5.12
Crystal	3.92			3.92
Maple Grove	7.73	Maple Grove	0.82	8.55
Minneapolis	3.15			3.15
New Hope	3.32			3.32
Osseo	0.45	Osseo	0.33	0.78
Plymouth	6.56			6.56
Robbinsdale	2.39			2.39
Total	44.56	Total	22.94	67.50

Note that the watershed boundaries used in all figures in this document are not the most up-to-date version. At the time of Plan submittal, an updated legal boundary is in review by the Commissions and therefore could not be used in Plan.

Each Commission is governed by a Board of Commissioners that is comprised of one member appointed from each community by their respective City Councils.

The Commissions' purpose is to preserve and use natural water storage and retention in the Shingle Creek and West Mississippi watersheds to meet Surface Water Management Act goals. Because many of the communities that are members of the Shingle Creek WMO are also members of the West Mississippi WMO the Commissions often work jointly on issues of interest to both, including this Fourth Generation Plan, and development Rules and Standards.

## Fourth Generation Watershed Management Plan

The Shingle Creek and West Mississippi Watershed Management Commissions initiated work on the Fourth Generation Plan in Fall 2021. The Plan includes information required in Minnesota Administrative Rules Chapter 8410, Metropolitan Water Management: an updated land and water resources inventory, goals and policies; an assessment of problems and identification of corrective actions; an implementation program; and a process for amending the Plan. The Commissions' standing Technical Advisory Committee (TAC) served as primary advisors to the Commissions. Each member city also designated one of its citizen's advisory commissions to provide public input to the plan.

# Executive Summary

In review of the Third Generation Plan, the Commissions and Citizen and Technical Advisory Committee acknowledged the Commissions' success and a desire to continue operations as usual, with some additional actions to address emerging issues. In the last ten years the Commissions have completed a number of projects, been extremely successful in receiving grant funds, have operated a successful regulatory program while maintaining a good relationship with developers, and have pursued special studies that have paved the way for water quality improvements. In discussions of potential improvements to the watersheds' functioning and desired focus areas under the Fourth Generation Plan, the Commissions and TAC identified the following:

- Continue making progress toward meeting water quality goals
- Provide more community engagement and education with adults, including with lake associations
- Continue to coordinate with DNR, MPCA, and cities
- Make progress toward eliminating the chloride impairment
- Increase community engagement with BIPOC and other underrepresented residents
- Undertake a climate vulnerability assessment
- Continue to complete subwatershed assessments to identify BMPs in older areas of the watersheds

## Priorities and Goals

Through discussion of potential improvements, the SCWM WMC identified four priorities and goals to drive their water resources planning and management. The four priorities for the Fourth Generation Plan are:

1. **Achieve lake and stream goals.** Continue to work aggressively toward achieving TMDL lake and stream goals.
2. **Stimulate implementation.** Foster completion of TMDL load reduction and other implementation activities by identifying improvements, sharing in their cost, and proactively seeking grant funds.
3. **Engage and educate.** Expand the public education and outreach program to reach more stakeholders, including vulnerable communities and historically underrepresented groups.
4. **Develop climate resiliency and sustainability.** Anticipate and proactively work to understand and minimize adverse impacts from changing environmental and climate conditions.

The four goals for the Fourth Generation Plan are:

1. Protect, maintain, and improve the water quality and ecological integrity of the water and natural resources within the watersheds and the downstream receiving waters.
2. Reduce stormwater runoff rates and volumes to limit flood risk, protect conveyance systems, protect surficial groundwater, and reduce or mitigate impacts that have already occurred.
3. Educate and engage all stakeholders in the watersheds on surface water issues and opportunities.
4. Anticipate and proactively work to withstand adverse impacts from changing environmental and climate conditions

## Implementation

This Fourth Generation Watershed Management Plan continues many activities that have been successful in the past, with some adaptations and additions. The Commissions will continue to undertake routine monitoring in lakes and streams; provide education and outreach opportunities, helping member cities to address their NPDES education requirements; review development and redevelopment for conformance with rules and standards; and implement a Capital Improvement Program that provides for

## Executive Summary

Commission 25 percent cost share for certain types of water quality improvement projects and 100 percent of the cost of lake and stream internal load projects.

- Monitoring Program. The revised monitoring program includes both routine monitoring and monitoring to support project implementation. The Shingle Creek Commission will conduct more intensive monitoring, including aquatic vegetation and fish sampling on a routine basis, with focus on lakes that are currently impaired and have planned projects. The Commission will rely on volunteer monitoring to evaluate potential changes in water quality on delisted lakes. Shingle Creek will continue routine dissolved oxygen monitoring and routine macroinvertebrate and fish sampling in the Creek. West Mississippi will now routinely monitor one to two sites per year, rotating through Mattson Brook (the outlet of Century/Edinbrook Channels), the Environmental Preserve outlet channel, and a Mississippi River outfall at 65<sup>th</sup> Avenue N.
- TMDL Implementation. In the Shingle Creek watershed, eight TMDL reports have been completed that address 16 impairments in 13 lakes and two streams. In addition, both the Shingle Creek and West Mississippi watersheds contribute pollutant loading to impaired regional waterbodies including the Mississippi River (bacteria and turbidity) and Lake Pepin (nutrients). Since the TMDLs were developed, three lakes have been delisted and two are planned for delisting in 2024. The Plan includes additional monitoring, education, and modeling activities to implement the Commissions' assigned responsibilities for the TMDLs.
- Education and Outreach/Diversity and Inclusion. The Commissions will enhance the existing education and outreach programming, which focuses on TMDL implementation and youth education, to more broadly reach out to adults, with a special emphasis on targeted outreach on chloride management issues. The Commissions will also expand diversity and inclusion efforts by coordinating with member cities and partners who have established relationships with diverse communities and incorporate environmental justice assessments and actions into projects and programs.
- Resiliency and Sustainability. The Commissions will work to better understand the impacts of climate change on local and regional water resources and infrastructure by modeling various future precipitation scenarios with the HUC8 Hydrologic & Hydraulic (H&H) model update that was completed in 2021-2022 and participating in a Climate Resilience Working Group with Hennepin County and other interested agencies and parties.
- Other Activities. Both Commissions will continue undertaking intensive BMP assessments for subwatershed areas systematically across the watersheds. Each year the Capital Improvement Program will include a capital levy to provide member cities with match funds to implement public projects identified in the intensive assessments and an additional fund to help fund voluntary practices on private properties. Both Commissions will continue to implement feasibility studies to understand and define potential improvement projects.

This watershed management plan provides direction for SCWM WMC activities through the year 2032. The Commissioners intend the Plan to provide a flexible framework for managing the watersheds and, as such, may initiate amendments to this plan at any time. The Commissions will annually review the Capital Improvement Program and may adopt plan amendments adding or revising proposed capital improvement projects.

## Abbreviations & Acronyms

BMP	Best Management Practice
BWSR	Board of Water and Soil Resources
cfs	cubic feet per second
cfu	colony-forming unit
Chl-a	Chlorophyll-a
Commission(s)	Shingle Creek and/or West Mississippi Watershed Management Commissions
DNR	Department of Natural Resources
DO	Dissolved oxygen
EPA	Environmental Protection Agency
F-IBI	Index of Biotic Integrity for Fish
ft <sup>3</sup>	Cubic feet
HCEE	Hennepin County Environment and Energy
IBI	Index of Biotic Integrity
JPA	Join Powers Agreement
LGU	Local Government Unit
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources
M-IBI	Index of Biotic Integrity for Macroinvertebrates
MPCA	Minnesota Pollution Control Agency
MS4	Municipal Separate Storm Sewer Systems
NAWQA	National Water Quality Assessment Program
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
NWI	National Wetland Inventory
NWS	National Weather Service
SCWM WMC	Shingle Creek and West Mississippi Watershed Management Commissions
SWPPP	Storm Water Pollution Prevention Program
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
µg/L	microgram per liter
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WCA	Wetland Conservation Act
WHEP	Wetland Health Evaluation Program
WLA	Wasteload Allocation
WMWA	West Metro Water Alliance
WMC	Watershed Management Commission
WMO	Watershed Management Organization



## Glossary

Best Management Practice (BMP)	A practice or combination of practices that is determined to be an effective and practicable means of preventing or reducing pollution from nonpoint sources to a level compatible with water quality goals.
Capital Improvement Program (CIP)	A short-range (10-year) plan which identifies capital projects and equipment purchases, provides a planning schedule, and identifies options for financing the plan.
Joint Powers Agreement (JPA)	A formal, legal agreement between two or more public agencies that share a common power and want to jointly implement programs, build facilities, or deliver services.
Index of Biological Integrity (IBI)	A metric that measures the biological community (fish or macroinvertebrates) of a water body. The index is a scale from 0-100 with 100 being the highest quality community.
Total Maximum Daily Load (TMDL)	A special study to identify the amount of a particular pollutant that a body of water can handle without exceeding water quality standards.
Waste Load Allocation (WLA)	A pollutant allocation assigned to a point source
Watershed Management Commissions	The citizen representatives from each watersheds' member cities.
Watershed Management Organizations	The watersheds' governing bodies.

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## 1.0 INTRODUCTION

### 1.1 INTRODUCTION & PURPOSE

The Shingle Creek and West Mississippi Watershed Management Commissions (SCWM WMC) were formed in 1984 using Joint Powers Agreements developed under authority conferred to the member communities by Minnesota Statutes 471.59 and 103B.201 through 103B.251. The Joint Powers Agreements are included in Appendix A. The watersheds are in the northwest portion of the Minneapolis-St. Paul seven county metropolitan area (Figure 1-1). The Commissions' purpose is to preserve and use natural water storage and retention in the Shingle Creek and West Mississippi watersheds to meet Surface Water Management Act goals. Because many of the communities that are members of the Shingle Creek WMO (watershed management organization) are also members of the West Mississippi WMO, the Commissions often work jointly on issues of interest to both and have adopted similar standards.

#### 1.1.1 First, Second, & Third Generation Plans

The Commissions adopted their initial or First Generation Management Plans in 1990. Each Commission adopted a separate plan, although many policies and actions were similar. For the Second Generation Plan, adopted in May 2004, the two Commissions elected to develop a joint management plan. The Second Generation Management Plan was amended six times between 2005 and 2010. Most of those revisions made changes or additions to the Capital Improvement Program. The Third Generation Management Plan was adopted in 2013 and was amended 14 times between 2014 and 2022. Most of those revisions were to revise the Capital Improvement Program, however, there were other significant amendments. In 2013 the Commissions amended the Rules and Standards to adopt the NOAA Atlas 14 hydrologic standards for the region, replacing the old TP-40 standards. The Commissions adopted a revised Capital Improvements Policy that increased the Commission cost share on certain types of projects that address "internal load" from 25% of the project cost to 100% of the project cost. Those projects, such as lake alum treatments or rough fish management, or stream restoration projects, are intended to correct problems in the receiving water itself, as opposed to reducing pollutant loading from the watershed.

The CIP policy was also amended to increase the suggested annual levy limit, and to eliminate the \$250,000 per project maximum for larger projects. Other revisions created specialized cost share programs and would allow cost share for the purchase of capital equipment that has a demonstrated effectiveness at reducing pollutant loading, such as high-efficiency street sweepers and road salt pre-wetting equipment.

Table 1.1. Record of revisions to the Third Generation Watershed Management Plan.

Number	Type	Date of Adoption	Summary of Revisions
		3/27/13	Plan approved by BWSR
		4/11/13	Plan adopted
1	Minor	7/11/13	Revise Rules and Standards to adopt Atlas 14 standards
2	Minor	5/8/2014	Revise CIP to add Bass Lake Pond Project
3	Major	12/11/2014	Add three Twin Lake subwatershed projects and create the Cost Share Program

Number	Type	Date of Adoption	Summary of Revisions
4	Minor	5/14/2015	Increase cost-share annual levy; increase internal load cost share to 100%; specify lake internal load project is Twin Lake Management Plan
5	Minor	11/12/2015	Revise plan and plan amendment process to conform to MR 8410 revisions
6	Minor	6/9/2016	Increase annual levy for city cost share; add Becker Park and Iron-Enhanced Sand Filter projects
7	Minor	5/11/2017	Add reaeration phase 2 and Palmer Estates projects
8	Minor	5/10/2018	Add SRP Reduction project; specify internal load project is Bass and Pomerleau Lakes Alum Treatment Project
9	Minor	5/9/19	Increase levy limit and project cap, specify internal load project is Crystal Lake Management Plan
10	Minor	8/8/19	Revise CIP to include certain capital equipment, and specify internal load project is Meadow Lake Management Plan
11	Minor	10/10/19	Revise CIP to add Plymouth street sweeper and River Park (WM)
12	Minor	5/13/21	Modify Palmer Estates project and add SRP Phase 2 project; add WM Partnership Cost Share program
13	Minor	5/12/22	Revise Rules and Standards to be consistent with the Minnesota General Stormwater Permit and other housekeeping edits
14	Minor	8/11/22	Revise CIP to create the Project Maintenance Fund

### 1.1.2 Plan Requirements

The Metropolitan Surface Water Management Act (Chapter 509, Laws of 1982, Minnesota Statute Section 473.875 to 473.883 as amended) establishes requirements for preparing watershed management plans within the Twin Cities Metropolitan Area. The law requires the plan to focus on preserving and using natural water storage and retention systems to:

- Improve water quality.
- Prevent flooding and erosion from surface flows.
- Promote groundwater recharge.
- Protect and enhance fish and wildlife habitat and water recreation facilities.
- Reduce, to the greatest practical extent, the public capital expenditures necessary to control excessive volumes and rate of runoff and to improve water quality.
- Secure other benefits associated with proper management of surface water.

To ensure these objectives are realized the Metropolitan Surface Water Management Act further specified the basic content of the watershed management plan. The plan must:

- Describe the existing physical environment and land use in the area, as well as the proposed environment, land use, and development outlined in existing local and metropolitan comprehensive plans.
- Present information on the hydrologic system and its components and potential problems related thereto.
- State objectives and policies including management principles, alternatives and modifications, water quality, and protection of natural characteristics.
- Set forth a management plan including the desired hydrologic and water quality conditions and significant opportunities for improvement.
- Describe the effect of the plan on existing drainage systems.

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- Identify high priority areas for wetland preservation, enhancement, restoration, and establishment and describe conflicts with wetlands and land use in those areas.
  - Describe conflicts between the watershed plan and existing plans of Local Governmental Units (LGUs).
  - Set forth an implementation program consistent with the management plan that includes a capital improvement program, standards, and schedules for amending the comprehensive plan and official controls of LGUs in the watershed to bring conformance with the plan.
  - Set out procedures and timelines for amending the plan.

## 1.2 PLAN ORGANIZATION

This plan is divided into four sections:

- 1 Introduction and Purpose:** Describes the authority and composition of the SCWM WMCs, the purpose of the Surface Water Management Act and the components of this watershed management plan.
- 2 Inventory and Condition Assessment:** A physical inventory for the watersheds, it includes a summary profile of the watersheds' existing environmental conditions. The full profile can be found in Appendix B and contains descriptions of the area's geology, topography, soils, biological and human environment, and current land use and projected land use to the year 2040. This section also contains information on the lakes, streams, and wetlands in the watersheds. Inventory and condition data presented on a subwatershed basis can be referenced in the Third Generation Plan. Shingle Creek has been subdivided into eight subwatersheds, which are seven lakesheds and the area of the watershed that drains directly to Shingle Creek. West Mississippi is subdivided into four subwatersheds.
- 3 Watershed Organization and Operations:** This section provides information about the Commissions, how they are organized, their history, and their responsibilities, and discusses ongoing operations. This section also provides an evaluation of the successes of the Third Generation Plan and the areas where the Commissions may have fallen short of their goals for the period 2013-2022.
- 4 Implementation Plan:** This section sets forth the goals the Commissions will work to achieve in the ten-year period covered by this Plan, and descriptions of the Commissions' proposed operating programs, the Capital Implementation Program, and a discussion of implementation costs and financing. It also discusses the methods by which the Commissions will evaluate progress towards achieving the goals set forth in the Plan, the process that will be followed should this Plan need to be Amended, and the requirements for Local Surface Water Management Plans prepared by the member cities in the two watersheds.

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## 2.0 INVENTORY & CONDITION ASSESSMENT SUMMARY

The Shingle Creek watershed covers 44.5 square miles and is comprised of nine cities: Brooklyn Center, Brooklyn Park, Crystal, Maple Grove, Minneapolis, New Hope, Osseo, Plymouth, and Robbinsdale. The West Mississippi watershed covers 23 square miles and is comprised of five cities: Brooklyn Center, Brooklyn Park, Champlin, Maple Grove, and Osseo. The watersheds are in east-central Hennepin County.

Refer to Appendix B Inventory and Condition Assessment for the full, detailed description of the watershed physical, environmental, and human environments. Refer to Appendix E Monitoring Program and Resource Management Plans for details on individual lakes and streams in the watersheds.

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## **3.0 WATERSHED ORGANIZATION & OPERATIONS**

### **3.1 SHINGLE CREEK & WEST MISSISSIPPI WATERSHED MANAGEMENT COMMISSIONS**

#### **3.1.1 Purpose & Authority**

The Shingle Creek and West Mississippi Watershed Management Commissions (SCWM WMC) were formed in 1984 using Joint Powers Agreements developed under authority conferred to the member communities by Minnesota Statutes 471.59 and 103B.201 through 103B.251. The Commissions' purpose is to preserve and use natural water storage and retention in the Shingle Creek and West Mississippi watersheds to meet Surface Water Management Act goals. Because many of the communities that are members of the Shingle Creek WMO are also members of the West Mississippi WMO, the Commissions often work jointly on issues of interest to both and have adopted similar standards.

The Metropolitan Surface Water Management Act (Chapter 509, Laws of 1982, Minnesota Statute Section 473.875 to 473.883 as amended) establishes requirements for watershed management plans within the Twin Cities Metropolitan Area. The law requires the plan to focus on preserving and using natural water storage and retention systems to:

- Improve water quality.
- Prevent flooding and erosion from surface flows.
- Promote groundwater recharge.
- Protect and enhance fish and wildlife habitat and water recreation facilities.
- Reduce, to the greatest practical extent, the public capital expenditures necessary to control excessive volumes and rate of runoff and to improve water quality.
- Secure other benefits associated with proper management of surface water.

#### **3.1.2 Commissions**

The Shingle Creek Watershed Management Commission is governed by a nine-member board comprised of representatives from each member city who are appointed by their City Council for staggered terms of three years. The West Mississippi Watershed Management Commission is governed by a five-member board, also comprised of representatives from each member city who are appointed by their City Council for staggered terms of three years. The Commissions meet monthly, holding a joint meeting on the second Thursday of each month. Meetings are open to the public.

#### **3.1.3 History**

Although the Commissions were formally established in 1984, their roots go back to the early 1970s, when seven communities jointly funded the 1974 Shingle Creek Basin Management Plan. This plan was developed in response to the USGS study of the Metro area for the National Flood Insurance Program. Engineers and staff members of the cities believed parts of the USGS study establishing 100- and 500-year flood elevations were in error and did not fully take into account local conditions, such as anticipated full development. During their discussions, the cities decided a joint management study should be undertaken to better understand the nature of the watershed's hydrology. The joint study recognized that future development in what were then largely undeveloped upstream cities such as Brooklyn Park,

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Champlin, Maple Grove, and Plymouth, could have a dramatic impact on flood elevations in downstream, developed cities such as Minneapolis, Brooklyn Center, Robbinsdale, Crystal, New Hope, and Osseo. After the 1974 study was completed and outstanding issues with the Flood Insurance Program resolved, the communities struggled with the next step. They were interested in jointly managing the watershed through the application of common standards, and in monitoring the entire watershed to assure the preservation of water quality and to reduce flooding potential. In the late 1970s Minnesota Statutes authorized communities to establish watershed management organizations, which could be accomplished by formation of either a watershed district or a joint powers commission. Each of these types of organizations has its strengths and weaknesses. After extensive discussions, in 1979 the cities decided to form joint powers commissions for the following reasons:

- The cities were very clear that they did not wish to create “another layer of government,” or more importantly, another taxing body.
- The cities desired to create a planning group that would develop the expertise to design and adopt water resource policies. They preferred that cities carry out the implementation of the overall watershed plan in accordance with uniform standards agreed to by all the cities.
- The cities were concerned that with a District, they would lose local representation and local control over issues that are often of great importance to their residents.
- The cities also did not want to create another bureaucracy with its own staff and equipment, duplicating what cities already had. Watershed Districts usually employ full time staff, and have extensive engineering and legal budgets

The joint powers type of organization was selected, in summary, because the cities believed that it provided the best balance of providing for the establishment of watershed wide policies and strategies for meeting watershed management requirements while at the same time retaining the most flexibility and local input at the lowest cost. When the Minnesota Legislature mandated watershed governance in the Metro area, the specific organizational charges, financing, and governance of the Shingle Creek and West Mississippi watershed management organizations were debated, and the joint powers agreements establishing the two Commissions were approved in 1984.

## **3.2 RESPONSIBILITIES**

### **3.2.1 Commissions**

A Board of Commissioners has been established as the governing body of each Commission. Each Board consists of one member appointed by each of the member governmental bodies, nine in Shingle Creek and five in West Mississippi. While the Commissions are governed by separate Boards, the Commissions hold joint meetings and jointly discuss business applicable to both. Four out of the five member cities of West Mississippi are also members of Shingle Creek; only Champlin is a member of West Mississippi and not Shingle Creek.

A Technical Advisory Committee (TAC) comprised of member city staff designees meets monthly or as needed to consider routine and other actions as requested by the Commissions. The TAC annually reviews the budget and Capital Improvement Program, screens proposed capital projects, evaluates their feasibility, and makes project recommendations to the Commissions. The TAC also serves as the TAC for research projects undertaken by the Commissions. There is no standing Citizens Advisory Committee.

Operating expenses are funded through an annual apportionment to each city. This apportionment is based 50 percent on land area and 50 percent on taxable value within the watershed. These expenses include the cost of contractual engineering, administrative, and legal services; programs such as water quality monitoring, public information and education, and special studies; and matching funds for grant-funded projects and studies.

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The Commissions' mechanism for funding capital improvements is identified in the current Joint Powers Agreements. Project costs are apportioned to the member cities in one of three ways, as determined by the Commission to be most appropriate for that particular project. The Commissions cannot directly levy taxes or special assessments but have the ability to assess members who subsequently decide how they want to generate the funds. In 2007 the Commissions adopted an amendment to the Second Generation Plan that states that for certain member city water quality capital projects, 25 percent of the project cost, up to \$250,000 may be funded by requesting that a county ad valorem tax be levied on all property in the watershed. In 2015 another revision to the CIP policy specified that certain "internal load" projects could be eligible for up to 100% funding by the Commissions. A revision to the Third Generation CIP eliminated the \$250,000 per project maximum for larger projects. The Commissions have been successful in obtaining outside grant dollars in recent years, thus reducing the financial burden on the member cities.

### **3.2.2 Relationship to Other Agencies**

*Cities.* Member cities all have approved stormwater management plans that assist the Commissions in implementing the Third Generation Watershed Management Plan. The cities have in place ordinances codifying the Commissions' development rules and standards, including stormwater management, erosion control, and wetland and floodplain management. City stormwater management programs vary by community, depending on fiscal capacity, degree of development, and water resources.

All the member cities in the two watersheds are National Pollutant Discharge Elimination System (NPDES) Municipal Separate Small Storm Sewer Systems (MS4s) and have approved NPDES permits and Stormwater Pollution Prevention Programs (SWPPPs) that include numerous activities to manage stormwater and prevent water resource degradation. Those SWPPPs also contain TMDL implementation actions to reduce pollutant loading and manage the rate and volume of stormwater runoff.

The Joint Powers Agreements do not authorize the Commissions to undertake capital improvement projects, but the Commissions do undertake research projects that may include a capital improvement component. The Commissions may order projects for construction by member cities, projects which one or more cities may cooperatively agree to construct and fund. In addition to Commission projects member cities may undertake their own projects, such as including BMPs in routine street reconstruction projects.

Aside from maintenance of their drainage systems and facilities, member cities also engage in water management-related activities such as Adopt-A-Park programs, urban forestry and Arbor Day activities, promotion of recycling and composting, and environmental education published in the city newsletter and website. In most cities the Park and Recreation Commission or some other Commission is charged with providing advice to the City Council on environmental matters, including watershed related matters.

*Minneapolis Parks & Recreation Board.* The Minneapolis Parks and Recreation Board (MPRB) provides environmental education and stormwater education within the Shingle Creek Watershed. MPRB also owns property along Shingle Creek, maintains and improves habitat, and engages in projects that effect the Creek. MPRB uses an Ecological Systems Plan to guide work within the park system to improve the ecosystem services and increase climate resiliency. MPRB also has a CIP separate from the City of Minneapolis CIP ensuring project alignment will improve our ability to partner on projects that meet our common goals of climate resiliency, improved ecological integrity, and equity.

*County.* Hennepin County Environment and Energy (HCEE) operates a number of programs to conserve natural and water resources in the county. HCEE works with public partners, such as SCWMWMC and its member cities, to support natural and water resource management through better coordination of regulatory activities, resident outreach, and project implementation. HCEE also provides technical and financial support to public entities and private residents to reduce erosion and nutrient runoff from urban and rural properties. For example, Natural Resource Grants, including the Opportunity and Good Steward



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Grants, have been awarded to SCWMWMC and its residents for installations of rain gardens in Brooklyn Park at Autumn Ridge and Brook Gardens Apartments, along with regional BMPs to improve stormwater treatment at Becker Park in Crystal and River Park in Brooklyn Park, and around Lake Schmidt in Plymouth. The County also participates in the education and outreach programming coordinated by the West Metro Water Alliance (WMWA) consortium of watershed management organizations in west Hennepin County. In 2013 the Hennepin Conservation District was dissolved, and its soil and water conservation district duties were transferred to Hennepin County.

In addition, HCEE operates volunteer education and monitoring programs, including the RiverWatch stream macroinvertebrate monitoring program for elementary and secondary school students, and the Wetland Health Evaluation Program (WHEP), a program for adult volunteers. In May 2022, the HCEE announced an end to the WHEP program as a result of limited staff capacity.

*Metropolitan Council.* The Metropolitan Council's Water Resources Management Policy Plan spells out a wide range of programs and activities undertaken by a variety of governmental and private agencies for management of water resources in the Metro area. Among the many programs and activities are several of particular interest to the Commissions: the development of targeted watershed pollutant loads; review of watershed and local water plans and comprehensive plans for consistency with Metro goals and objectives; grant programs; the Citizens' Assisted Lake Monitoring Program (CAMP); and the Environmental Information Management System. The Shingle Creek Commission has partnered with the Metropolitan Council's CAMP program since the 1990s to support citizen volunteer lake water quality monitoring.

*Minnesota Pollution Control Agency.* The MPCA operates several programs applicable to watershed planning. The MPCA monitors water quality, sets standards, and implements various controls. Of particular interest are the National Pollutant Discharge Elimination System (NPDES) program and implementation of the Clean Water Act. The MPCA manages the NPDES Phase I construction and industrial stormwater discharge permitting. MPCA also manages the NPDES Phases I and II permitting for municipal separate storm sewer systems (MS4s). Minneapolis falls under the requirements of NPDES Phase I and the nine other cities in the Shingle Creek and West Mississippi watersheds fall under the requirements of NPDES Phase II. Hennepin County, MnDOT, North Hennepin Community College, and North Hennepin Technical College are also MS4s with conveyances in Shingle Creek and West Mississippi.

The MPCA implements the Clean Water Act's requirement that states adopt water quality standards to protect the nation's waters. The Environmental Protection Agency (EPA) and MPCA require managers of water resources that fail to meet these established standards to prepare a Total Maximum Daily Load (TMDL) study identifying the source of the pollutant and a plan for bringing the water resource into compliance.

The Shingle Creek Commission worked closely with the MPCA and received funding from that agency to complete TMDLs and Implementation Plans on 13 lakes as well as Shingle Creek and Bass Creek. The MPCA has also provided funding through the Section 319 grant program to complete Commission research projects, including the Wetland 639W Feasibility Study and Outlet Modification project, Paired Intersection Study, the Modular Green Roof project, the SRP Reduction project at the outlet of Wetland 639, and the Crystal Lake Management Plan project.

*Board of Water and Soil Resources.* The Board is the state's administrative agency for 90 soil and water conservation districts, 46 watershed districts, 23 metropolitan watershed management organizations, and 80 county water managers. BWSR's core functions include implementing the state's soil and water conservation policy, comprehensive local water management, and the Wetland Conservation Act (WCA). BWSR periodically assesses watershed organizations as part of its Performance Review and Assistance Program (PRAP). Both Commissions were assessed in 2009. BWSR found that "The Shingle Creek

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Watershed Management Commission operates as an effective, collaborative entity for addressing complex watershed management issues in a developed urban area. They have aggressively pursued major program elements of their watershed management plan and have made significant progress in plan implementation.”

The report on West Mississippi stated that “The West Mississippi Watershed Management Commission has taken good advantage of their partnership with the Shingle Creek Watershed Management Commission to start or complete a significant percentage of their watershed management plan action items. However, some of the action items dealing with key aspects of watershed management, particularly monitoring of stream flow and quality, groundwater, and wetland quality, have not been pursued aggressively.” As a result of the PRAP process, West Mississippi developed and implemented a monitoring program.

The Commissions also work closely with BWSR to develop and implement their watershed management plans. BWSR wetland specialists participate in Technical Evaluation Panels in the watersheds to assess potential wetland impacts and mitigation strategies. BWSR also periodically audits the Commissions to assure that WCA is being administered properly.

Finally, BWSR is the implementation agency for the Clean Water Funds grant program funded by the Clean Water, Land, and Legacy Amendment. The Shingle Creek Commission has received several Legacy grants to implement projects to improve water quality, including most recently the Becker Park Infiltration Project, Bass Creek Restoration, Shingle Creek Connections II stream restoration, and the Meadow Lake Drawdown project.

*Minnesota Department of Health.* The Environmental Health Division of the MDH operates many programs of interest to the Commissions. Programs include Drinking Water Protection, Wellhead Protection, Lake and Fish Monitoring (in partnership with DNR/MPCA), Environmental Health Services, Health Risk Assessment, Site Assessment, and Consultation and Well Management.

*Minnesota Department of Natural Resources.* The DNR manages and protects the state’s natural resources and operates numerous programs. The department provides technical assistance and information regarding best management practices, natural resource management, incorporating natural resource conservation in land use planning, and lakescaping. The Fisheries Division monitors and improves fisheries within the state including many of the lakes within the SC WMC. It also promotes fishing opportunities and provides grants to assist in the construction of fishing piers. The Ecological and Water Resources (EWR) Division focuses on an overarching vision of “Healthy Watersheds throughout Minnesota.” “Healthy Watersheds” include: 1) sustainable quantities and qualities of water; 2) sustainable levels of biodiversity; 3) wellfunctioning ecosystem services; and 4) sustainable and vibrant natural resource economies and recreational opportunities.

The DNR’s webpage at <http://www.dnr.state.mn.us/lakefind/index.html> is LakeFinder, a DNR supported tool that combines information from various DNR Divisions, as well as other state agencies, such as Minnesota Pollution Control Agency (water quality) and Minnesota Department of Health (fish consumption). This tool contains data for more than 4,500 lakes and rivers throughout Minnesota.

The DNR also provides a variety of specialized programs oriented to property owners or neighborhood groups, such as the Aquatic Plant Management, Urban Fisheries and Fishing in the Neighborhood, Neighborhood Wilds, and Metro Greenways programs. The Shingle Creek Commission has received a DNR Conservation Partners Legacy grant for vegetation improvements in Bass Lake.

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## 3.3 OPERATIONS

This section describes the current programs operated by the Shingle Creek and West Mississippi Watershed Management Commissions.

### 3.3.1 Education & Outreach

The Commissions initially established an Education and Outreach Program as part of the Second Generation Plan and have been implementing that program since then. The Commissions created a standing Education and Public Outreach Committee (EPOC), composed of city representatives and other interested parties, and charged it with advising the Commissions and implementing the annual education and public outreach program.

At the same time that the Commissions were developing their Second Generation Plan, the member cities (except Minneapolis) were required to develop education and outreach plans as part of their National Pollution Discharge Elimination System (NPDES) Phase II stormwater permits. Because these requirements were common across the Phase II cities, the member cities requested that the Second Generation Plan Education and Outreach Program be designed to fulfill the Public Education and Outreach Minimum Measure, and that request was carried over to the Third Generation Plan. Minneapolis is an NPDES Phase I city, with a different but similar set of requirements.

An additional education and outreach requirement developed during the Implementation of the Second Generation Plan. The Shingle Creek Commission completed Total Maximum Daily Load (TMDL) studies for 13 of the 16 lakes in the watershed that did not meet State standards for total phosphorus concentration. TMDLs were also completed for Shingle Creek chloride and dissolved oxygen impairments, and impairment of the biological communities in Shingle and Bass Creeks. All these TMDLs included education and outreach activities in their Implementation Plans.

The Commissions' Education and Public Outreach Committee now mostly works with the West Metro Water Alliance (WMWA), a collaborative formed by the Commissions with the Elm Creek WMO and Bassett Creek WMO. While the Commissions do continue to provide local education and outreach, the four WMOs pool resources to take on larger, more visible initiatives. The most significant and far-reaching program is Watershed PREP, in which contracted educators present water resource-based classes to fourth grade students. **Lesson 1, *What is a Watershed and Why Do We Care?*** provides an overview of the watershed concept and is specific to each school's watershed. It describes threats to the watershed. **Lesson 2, *The Incredible Journey***, describes the movement and status of water as it travels through the water cycle. Since the program's inception in 2013, over 20,700 students have participated in lesson 1, and 6,700 in Lesson 2. The educators also provide outreach services such as tabling at city and school events.

The Commissions also are active participants in the Hennepin County Chloride Initiative (HCCI). In 2018, BWSR made Watershed-Based Funding Implementation Grants (WBIF) available to WMOs in the Metro Area. The 11 WMOs in Hennepin County agreed to allocate 10 percent of their funding, or \$101,800, to jointly undertake actions to minimize the use of chloride-based road salt across the county, particularly by private applicators. The HCCI used those funds to complete several activities, including outreach to applicators to determine barriers to reducing the use of salt; development of a handbook on smart salting for property managers; development of winter management templates for property managers; a case study evaluating options within the Parker's Lake drainage area; and a branding and marketing campaign.

Details regarding the education and outreach activities may be found in the Commissions' Education and Outreach Annual Activity Report. Some highlights over the past ten years are:

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- In partnership with Hennepin County, student and adult volunteer monitoring of selected stream and wetland sites in the watersheds
  - In partnership with the Metropolitan Council, volunteer lake water quality monitoring on 4-6 lakes per year.
  - In partnership with WMWA, workshops on rain gardens and sustainable turf management.
  - An annual watershed-wide cleanup event coinciding with Earth Week
  - Education and outreach materials highlighting proper use of road salt for snow and ice control.
  - Education and outreach materials targeted to homeowners' associations "Manage Your Property the Watershed Friendly Way"
  - Outreach to local print and cable television for news coverage of commission and city projects.
  - Made presentations at a number of lake association meetings
  - Outreach to multi-family living communities by Metro Blooms through the Partnership Cost Share Program

### 3.3.2 Monitoring Program

Minnesota Administrative Rule 8410.0100 Subp. 5 requires watershed management organizations to conduct monitoring programs "capable of producing accurate data to the extent necessary to determine whether the water quality and quantity goals of the organization are being achieved." The monitoring objectives guiding the Shingle Creek and West Mississippi monitoring program and the assessment of data are:

- To quantify the current status of streams and lakes throughout the watersheds in comparison to state water quality standards.
- To quantify changes over time, or trends, in stream and lake water quality in the watersheds.
- To quantify the effectiveness of implemented BMPs throughout the watersheds for the protection of water quality.
- To evaluate progress toward meeting and maintaining TMDL load reduction and other goals.

The Commissions publish an annual Water Quality Report which presents data from the current year as well as water quality and quantity trends. That trend data is included in this Plan in the subwatershed inventory sections above. The following are short descriptions of the current monitoring program.

*Stream and Outfall Monitoring.* The Commissions began monitoring water quality and streamflow in 1990 at 12 sites in the Shingle Creek watershed and at seven sites in West Mississippi. Monitoring was discontinued from 1992 – 1995, when routine stream monitoring on Shingle Creek was reestablished and has been performed on an annual basis until present. No further monitoring was conducted in West Mississippi until 2010 and 2011, when four sites were monitored to evaluate current conditions and change since the 1990s. West Mississippi has monitored two sites per year on a rotating basis since that time.

Stream and outfall monitoring sites are shown on Figure 3-1. Continuous flow monitoring and water quality data is collected at two locations in Shingle Creek and one location in Bass Creek. Station SC-0, also referred to as the outlet monitoring site, is located upstream of the 45<sup>th</sup> Avenue crossing in Minneapolis. The SC-3 monitoring station is located downstream of where Shingle Creek crosses Brooklyn Boulevard in Brooklyn Park. The BCP monitoring station is located in Bass Creek Park upstream of the confluence of Bass Creek and Shingle Creek. SC-0 collects drainage from about 41 square miles, or approximately 92% of the watershed. The SC-3 drainage area covers about 17 square miles, which is approximately 39% of the Shingle Creek watershed. BCP drains approximately 8 square miles, or approximately 18% of the watershed. West Mississippi has Mattson Brook, the Environmental Preserve (ENVP) and some storm sewer outfalls (65<sup>th</sup> Ave and Oxbow Creek).

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There is also a long-term USGS monitoring station on Shingle Creek at Queen Avenue near the border of Minneapolis and Brooklyn Center. This site is located upstream of SC-0 and drains approximately 31 square miles (70% of the watershed). The Shingle Creek WMC and USGS collected continuous flow and storm event samples at this location from 1996 through 1999. The USGS continued monitoring continuous flow at this site in 2001 and then began monitoring continuous conductivity at this site year around beginning in 2004. Real-time data is available through the USGS website (<https://waterdata.usgs.gov/monitoring-location/05288705/#parameterCode=00065&period=P7D>).

*Lake Monitoring.* Fourteen of the sixteen lakes in Shingle Creek are periodically monitored for water quality by the Commissions through their intensive lake monitoring program and by volunteers through the Citizen Assisted Monitoring program (CAMP). Three Rivers Park District performs some monitoring on lakes that are of interest and also under contract for member cities. The two unmonitored lakes – Curtis and Palmer – are considered by the DNR to be wetlands and have limited access.

*Biologic Monitoring.* High school volunteers coordinated by Hennepin County Environment and Energy (HCEE) perform macroinvertebrate monitoring at various locations on Shingle and Bass Creeks in Shingle Creek and on Mattson Brook in West Mississippi. The Commissions began working with HCEE to also obtain wetland monitoring data from adult volunteers before the Third Generation Plan through the Wetland Health Evaluation Program (WHEP), which was discontinued in 2022.

The Shingle Creek Commission has undertaken detailed macroinvertebrate monitoring and some fish sampling at various locations on Shingle, Bass, and Pike Creeks as part of the Shingle Creek Corridor Study and the Shingle and Bass Creeks Biota and Dissolved Oxygen TMDL and 5-Year Review. The USGS also undertakes periodic fish and macroinvertebrate sampling at the USGS monitoring site at Queen Avenue in Minneapolis. The DNR conducts fisheries surveys on lakes in the watershed on a routine basis.

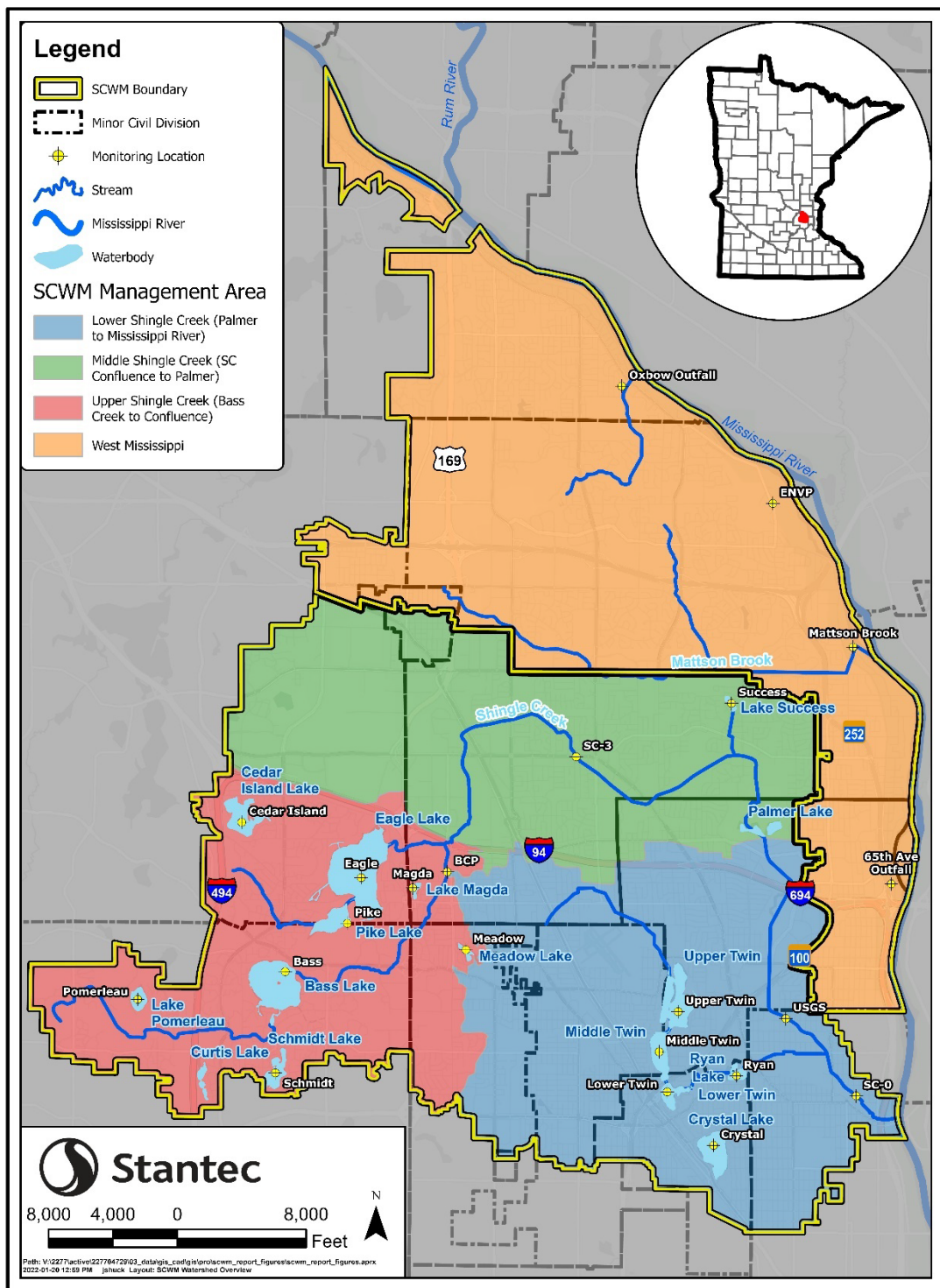


Figure 3-1. Routine monitoring sites in Shingle Creek and West Mississippi.

### 3.3.3 Rules and Standards & Project Reviews

The Commissions do not issue permits but do require development and redevelopment projects to meet Commission requirements for runoff rate control, treatment, and volume management. Those requirements as well as others relating to wetlands, floodplains, erosion control, buffers, and stream crossings are set forth in Rules and Standards. The Commissions first adopted standards soon after they were formed in 1984. The standards were significantly revised in 2002 and issued jointly in 2003 as part of the Second Generation Management Plan. The standards were reviewed and revised in 2008 as part of the Third Generation Management Plan and again in 2022 to maintain consistency with the Minnesota General Stormwater Permit requirements. The Commissions act as the Local Government Unit (LGU) for Wetland Conservation Act (WCA) administration for about half the member cities.

The Commissions were among the first watershed management organizations in Minnesota to require runoff volume management, incorporating into the 2003 standards a requirement to infiltrate  $\frac{1}{2}$ " of runoff from impervious surface. The 2008 revisions redefined that requirement as an abstraction requirement, providing for alternate volume management techniques such as storage and re-use or enhanced evapotranspiration. In 2013 that requirement was increased to 1" of runoff and in 2022 to 1.1", with differential requirements for linear projects.

Development and redevelopment projects that meet certain size and other criteria are required by city ordinances to incorporate into their developments Best Management Practices (BMPs) sufficient to meet the Commissions' Rules and Standards. Engineering plans, hydrologic calculations, wetland delineations, and other supporting material is submitted to the Commissions' Engineer, who conducts a Project Review and discusses the proposal and any necessary revisions with the developer. Findings are summarized in an Engineer's Report to the appropriate Commission, which will either approve the plans as is or with minor modifications or will reject the plans. A final, approved Engineer's Report is forwarded to the member city in which the development is located for its use in considering the proposed development or redevelopment for approval. Table 3.1 summarizes the projects reviews that have been completed during 2013-2021. These project reviews include private development and redevelopment as well as public projects such as street and highway projects.

Table 3.1. Project reviews, 2013-2021.

Year	Shingle Creek		West Mississippi	
	Project Reviews	Wetland Only	Project Reviews	Wetland Only
2013	17	2	4	3
2014	17	5	13	5
2015	10	4	7	3
2016	10	4	10	2
2017	8	5	10	4
2018	13	2	5	1
2019	10	9	10	6
2020	12	5	7	3
2021	9	4	11	1
2022	7 *	1 *	4 *	0 *
TOTAL	106	40	81	28

\*Through September 2022

The Commissions also are consulted by other agencies working on large transportation projects, and the Engineer has participated in early planning efforts for the Blue Line Light Rail Extension, the I-494 3<sup>rd</sup> Lane project, and the upcoming I-94/TH 252 upgrades. Finally, the Commissions also review and

comment on special studies that identify potential water resources impacts from development, redevelopment, and transportation projects, such as Environmental Assessments (EAW), Environmental Impact Statements (EIS) and Alternative Urban Areawide Reviews (AUAR). Some of these include:

- Hennepin County State Aid Highway 103 (West Broadway)
- Hennepin County State Aid Highway 81 (Bottineau Boulevard)
- Vicksburg Lane Extension in Plymouth
- Target Area AUAR in Brooklyn Park

### 3.3.4 Administration

Administration includes preparing for and attending routine and special meetings; taking minutes and record keeping; grant writing; correspondence; filing; and financial reporting. Administrative and technical consulting staff also administer grants on behalf of the Commissions, completing work plans, preparing interim and final reports, and invoicing.

## 3.4 ASSESSMENT OF THIRD GENERATION MANAGEMENT PLAN PERFORMANCE

In preparation for the Fourth Generation Management Plan, the Commissions conducted a self-assessment to identify achievements and areas for improvement. The self-assessment is included in this Plan as Appendix C. This section is a summary of that report. The Commissions have completed or will have completed by 2022 nearly all the work plan activities and strategies identified in the Third Generation Plan. The most successful achievements of the Third Generation Plan were:

- Operating a strong regulatory program through project reviews for development and redevelopment projects.
- The Commissions have been very successful at applying for and receiving grants to undertake projects and special studies. As detailed in Table 3.2 this has provided nearly \$3.5 million to supplement local funding.
- The Commission has completed numerous implementation projects under the Third Generation Plan, totaling over \$9 million (Table 3.2).
- Completion of special studies including subwatershed assessments to identify areas for small BMP implementation projects, and the HUC8 Special Hazard Areas Study to update hydrologic and hydraulic modeling for the Shingle Creek watershed using the most recent Atlas 14 rainfall depths and distributions.
- The joint powers Commissions have continued to enhance collegiality and collaboration between the cities in the two watersheds.

Table 3.2. Commission capital improvement projects and levies, 2013-2021.

Year	Project Name	Commission Share	Local Share	Grants	Total Cost	Amount Levied
2014	Bass Lake Improvements	\$210,000	\$630,000	\$0	\$840,000	\$210,000
2014	City Cost Share	\$50,000	\$50,000	\$0	\$100,000	\$50,000
2015	City Cost Share	\$100,000	\$100,000	\$0	\$200,000	\$100,000
2015	Shingle Creek Reaeration	\$42,500	\$34,000	\$93,500	\$170,000	\$42,500
2015	Twin Lake Carp Mgmt	\$125,000	\$0	\$100,000	\$225,000	\$125,000
2015	Partnership Cost Share	\$50,000	\$50,000	\$0	\$100,000	\$50,000
2016	City Cost Share	\$100,000	\$100,000	\$0	\$200,000	\$101,000
2016	Biochar Enhanced Filters	\$210,000		\$199,625	\$409,625	\$212,100



Year	Project Name	Commission Share	Local Share	Grants	Total Cost	Amount Levied
2016	Partnership Cost Share	\$50,000	\$50,000	\$0	\$100,000	\$50,500
2017	City Cost Share	\$100,000	\$100,000	\$0	\$200,000	\$106,050
2017	Partnership Cost Share	\$50,000	\$50,000	\$0	\$100,000	\$53,025
2018	City Cost Share	\$100,000	\$100,000	\$0	\$200,000	\$106,050
2018	Partnership Cost Share	\$50,000	\$50,000	\$0	\$100,000	\$53,025
2018	Becker Park Infiltration	\$250,000	\$1,175,000	\$1,075,000	\$2,500,000	\$265,125
2018	SRP Reduction Project	\$52,510	\$0	\$72,170	\$124,680	\$55,700
2018	Bass/Pomerleau Alum <sup>1</sup>	\$390,000	\$0	\$267,040	\$390,000	\$0
2019	City Cost Share	\$100,000	\$100,000	\$0	\$200,000	\$106,050
2019	Partnership Cost Share	\$50,000	\$50,000	\$0	\$100,000	\$53,025
2019	Crystal Lake Mgmt Plan	\$154,440	\$0	\$216,066	\$370,506	\$163,785
2020	City Cost Share	\$100,000	\$100,000	\$0	\$200,000	\$106,050
2020	Connections II Stream Restoration	\$400,000	\$0	\$328,000	\$400,000	\$424,200
2020	Plymouth Street Sweeper	\$75,000	\$275,000	\$0	\$350,000	\$79,540
2020	Meadow Lake Mgmt Plan	\$300,000	\$0	\$40,000	\$300,000	\$318,150
2020	Meadow Lake Mgmt Plan	\$0	\$0	\$153,510	\$0	\$0
2020	Bass Creek Restoration	\$400,000	\$0	\$70,000	\$400,000	\$424,200
2020	Partnership Cost Share	\$50,000	\$50,000	\$0	\$100,000	\$53,025
2021	City Cost Share	\$100,000	\$100,000	\$0	\$200,000	\$106,050
2021	Partnership Cost Share	\$50,000	\$50,000	\$0	\$100,000	\$53,025
2021	Palmer Estates Stream Restoration	\$600,000	\$0	\$384,000	\$600,000	\$636,300
2021	SRP Channel Phase I <sup>2</sup>	\$50,000	\$0	\$75,000	\$125,000	\$0
2021	SRP Channel Phase II	\$125,000	\$0	\$0	\$125,000	\$132,565
	<b>TOTAL</b>	<b>\$4,484,450</b>	<b>\$2,250,000</b>	<b>\$3,073,911</b>	<b>\$9,529,811</b>	<b>\$4,236,040</b>

<sup>1</sup> Commission share was paid for using the proceeds from the 2014 Bass Lake Improvements levy

<sup>2</sup> Commission share was paid for from the Closed Projects Account.

Areas that fell short of Third Generation expectations or which could be improved include:

- Coordination of monitoring plans between the Commissions and City
- Collaboration with State agencies (MPCA, DNR, etc.)
- Improving relationships with Lake Associations
- While there has been an increased level of awareness on the part of elected and appointed officials, advisory commissioners and non-engineering city staff, there continues to be a need to increase their knowledge about water resources issues.
- Addressing environmental inequities
- Making progress on the chloride impairment

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## 4.0 IMPLEMENTATION PLAN

### 4.1 ASSESSMENT OF PROBLEMS & ISSUES

#### 4.1.1 Problem Assessment

Identification of problem areas was completed through ongoing discussions with the Commissioners and Technical Advisory Committee, and input from member city Citizens Advisory Committees. In addition, the City of Plymouth surveyed 227 residents about their top concerns. Plymouth residents' top issues:

- Need to prevent pollutants like chloride, fertilizer, and pet waste from entering lakes and streams
- Concern about aquatic invasive species
- Concern about health of habitats for aquatic life
- Impacts of climate change on water levels and habitats

Table 4.1 shows the problems/issues in no particular order of priority.

Table 4.1. Identified problems and issues.

Problem	Discussion
Continued progress toward meeting water quality goals	While the Commissions have made great strides in improving conditions in the lakes and streams in the watersheds, there continue to be persistent water quality issues to address.
More community engagement and education with adults, including with lake associations	The Commissions through WMWA have undertaken a very successful education program geared toward school age children in the watersheds but have been less systematic about outreach to adults.
Continue to coordinate with DNR, MPCA, and cities	The Commissions are most successful when they can work in partnership with others to leverage resources, skills, and opportunities.
Make progress toward eliminating the chloride impairment	While work in the watersheds has slowed the increase in chloride concentrations in receiving waters, it remains high, and increasing concentrations in summer baseflow suggest it has seeped into surficial groundwater.
Increased community engagement with BIPOC and other underrepresented residents	The Commissions have successfully partnered with Metro Blooms to help engage BIPOC residents in multifamily communities. There is a broad need to enhance outreach to other diverse communities as the watersheds become more diverse.
Need for a climate vulnerability assessment	Climate data in Minnesota shows an increase in intensity and depth of precipitation events, as well as changes in temperature normal, humidity, and other factors that can impact our water resources and infrastructure. A vulnerability assessment will help the Commissions and cities understand the range of potential impacts so that adequate steps can be taken to protect public health and safety.
Continue to complete subwatershed assessments to identify BMPs in older areas of the watersheds	Much of the older areas in the watersheds developed prior to the establishment of development rules and standards requiring water quality and volume/runoff rate controls. While some retrofit has occurred with street and highway projects, subwatershed assessments of smaller catchments have been beneficial at identifying opportunistic BMPs.

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In addition, the City of Minneapolis conducted public outreach events at two neighborhood associations in the Shingle Creek Watershed. Comments received from the events include:

- Would like information on how the city's monetary contribution to the Commission is being spent in the city/neighborhoods.
- Consider focusing on obtaining grants to enhance equity measures in overburdened communities. Would prefer the money to be spent on projects and that the Commission use the community to do the outreach. They would also like to know what part of projects can be managed or done by residents or can be done to save money, such as engagement by residents.
- There are environmentally focused and community engagement organizations in the area that could be involved in watershed work and who coordinate environmentally focused events such as a Clean Sweep in fall and spring and youth training.
- There is a lack of understanding about the Commission and stormwater needs in general that could be communicated better if meaningful input from residents is desired. This could include email blasts to neighborhood associations for seasonal needs (e.g., salt application early winter, or adopt a drain in the fall).
- Residents are very concerned about chloride pollution.

#### 4.1.2 Identification of Priority Issues

Identification of priority issues was completed through the Problem Assessment and ongoing discussions with the Commissioners and Technical Advisory Committee, and discussion at the member cities' Citizens Advisory Committee. The following issues were identified as high priority for the Fourth Generation Management Plan:

##### **FOURTH GENERATION MANAGEMENT PLAN PRIORITIES**

1. **Achieve lake and stream goals.** Continue to work aggressively toward achieving TMDL lake and stream goals.
2. **Stimulate implementation.** Foster completion of TMDL load reduction and other implementation activities by identifying improvements, sharing in their cost, and proactively seeking grant funds.
3. **Engage and educate.** Expand the public education and outreach program to reach more stakeholders, including vulnerable communities and historically underrepresented groups.
4. **Develop climate resiliency and sustainability.** Anticipate and proactively work to understand and minimize adverse impacts from changing environmental and climate conditions.

## 4.2 FOURTH GENERATION MANAGEMENT GOALS & ACTIONS

Through the identification and prioritization of issues in the watersheds, the Commissions developed goals that will guide activities over the coming decade. These goals were derived from the self-assessment and unfinished business from the Third Generation Plan; discussions with Commissioners, Technical Advisory Committee members, state agency staff, other city staff; and the prioritization process. The four goals are as follows:

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#### **FOURTH GENERATION MANAGEMENT PLAN GOALS**

1. Protect, maintain, and improve the water quality and ecological integrity of the water and natural resources within the watersheds and the downstream receiving waters.
2. Reduce stormwater runoff rates and volumes to limit flood risk, protect conveyance systems, protect surficial groundwater, and reduce or mitigate impacts that have already occurred.
3. Educate and engage all stakeholders in the watersheds on surface water issues and opportunities.
4. Anticipate and proactively work to withstand adverse impacts from changing environmental and climate conditions.

The framework to achieve these goals is set forth in the Implementation Plan and Capital Improvement Program detailed in the following sections. Member cities supplement and complement these actions with additional policies and programs tailored to their unique priorities and needs. The philosophy of the Joint Powers Agreements and this Plan is that the management plan establishes certain common goals and standards for water resources management in the watersheds, agreed to by the member cities, and implemented by those cities by activities at both the Commission and local levels. Successful achievement of the goals in this Plan is dependent on those member cities and their dedication to this effort.

#### **4.2.1 Water Quality & Ecological Integrity**

While the Commissions' First Generation Plans were primarily focused on adopting and implementing standards for development and redevelopment projects to moderate the impacts of stormwater runoff on receiving waters, by the time of the Second Generation Plan water quality monitoring confirmed that several lakes did not meet state water quality standards. Thirteen of the sixteen lakes were subsequently designated as Impaired Waters by the MPCA due to high concentrations of nutrients. The Shingle Creek Commission was an early implementer of Total Maximum Daily Load (TMDL) studies to diagnose the sources of this excess phosphorus and develop implementation plans to reduce nutrients to the lakes. Shingle Creek and Bass Creek were also found to be high in chloride and *E. coli* concentrations, low in dissolved oxygen, and non-supportive of fish and other aquatic life.

The Second and Third Generation Plans focused on implementing capital and other projects and assessing progress. As noted in this Plan's Self-Assessment of Progress, those efforts have paid off: three of the original thirteen lakes (Schmidt, Ryan, and Lower Twin) have been removed from the official Impaired Waters List, and two more (Bass and Pomerleau) are slated to be removed, or "de-listed" in 2024. Monitoring data also shows a significant improvement in some water quality parameters in Shingle and Bass Creeks, but not all: chloride and bacteria remain stubbornly high. The fish and biotic communities remain impaired in the creeks, and several lakes are infested with invasive aquatic vegetation.

Wetlands also perform a key role in the ecological integrity of the watersheds. Much of the original acreage of wetlands in Shingle Creek has either been filled or significantly altered by development. The northern half of West Mississippi developed much later, under the regulation of the Wetland Conservation Act (WCA). While they have not been filled, many of the wetlands in that watershed have been altered by changing hydrology that redirected runoff and reduced surficial groundwater recharge. While there are a few wetlands of higher quality, most have been impacted to some degree.

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The Fourth Generation Plan will continue to focus on improving the lakes and streams in the watersheds to meet state water quality and ecological integrity standards and protecting those that meet those standards. The primary implementation strategies will be to:

- Limit further lake, stream, and wetland impacts from development and redevelopment.
- Identify and undertake protection and improvement actions such as subwatershed assessments, feasibility studies, and non-structural and capital improvement projects.
- Achieve state water quality standards in three more lakes – Eagle, Crystal, and Middle Twin Lakes and if possible, achieve de-listing from the Impaired Waters list.
- Limit as feasible under the Wetland Conservation Act any further impacts to wetlands in the watersheds.

The Commission will continue to operate a robust monitoring program to track water quality trends and assess progress.

**Goal 1: Protect, maintain, and improve the water quality and ecological integrity of the water and natural resources within the watersheds and the downstream receiving waters.**

Goal 1 Strategies

- 1.a. Manage the surface water resources of the watershed to improve water clarity in the balance of the lakes by 10% over the average of the previous ten years.
- 1.b. Implement load reduction actions sufficient to achieve state water quality standards in Eagle, Crystal, and Middle Twin Lakes.
- 1.c. Make progress toward achieving the state standards in the other lakes and streams in the watersheds.
- 1.d. Administer rules and standards requiring new development and redevelopment to control the loading of pollutants from their sites.
- 1.e. Maintain as feasible no net loss of wetland acreage and functions and values.

## **4.2.2 Water Quantity, Groundwater, & Drainage**

One of the statutory responsibilities of the Commissions is to prevent and mitigate flooding. This has been accomplished primarily by ensuring that development and redevelopment does not create new volumes and rates of runoff that may cause downstream flooding. Despite the extensive upper watershed development that has occurred since the Commissions were established in 1985, there are few non-localized flooding problems in the two watersheds. Early on the Commissions and member cities identified this as an important issue and enacted the appropriate controls to limit rates and volumes of runoff from new development and redevelopment. A second Commission responsibility is managing or staying abreast of surface water-groundwater interactions, including groundwater recharge, stream baseflow and lake levels, wellhead protection and maintaining adequate hydrology to wetlands. Hennepin County intends to update its Groundwater Plan in the next several years, and the Commissions will provide input to that analysis and assist in implementing County priority actions.

Shingle Creek from approximately Xerxes Avenue North in Brooklyn Park to Webber Park in Minneapolis was ditched and channelized as Hennepin County Ditch #13 in 1910 and remains under the County's jurisdiction. Hennepin County is willing to transfer authority to the Shingle Creek Commission or the

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member cities, but neither has expressed an interest. Hennepin County is also willing to pursue ditch abandonment that would allow for authority transfer to the MnDNR as a public watercourse.

This Fourth Generation Plan will continue to rely on the development rules and standards to limit new rates and volumes of runoff and to require infiltration or other abstraction such as stormwater reuse to protect and replenish surficial groundwater. The Commission also maintains a hydrologic and hydraulic model for the watershed that was updated in 2021 and will be used to track any impacts to flood flows and elevations due to land use change.

**Goal 2: Reduce stormwater runoff rates and volumes to limit flood risk, protect conveyance systems, protect surficial groundwater, and reduce or mitigate impacts that have already occurred.**

Goal 2 Strategies

- 2.a. Maintain the existing 100-year flood profile throughout the watersheds.
- 2.b. Administer rules and standards requiring new development and redevelopment to control the rate and volume of runoff from their sites.
- 2.c. Work with Hennepin County to identify the proper jurisdiction for Shingle Creek, where currently designated as County Ditch #13, that provides the most consistent support and protection for the resource
- 2.d. Work in cooperation with Hennepin County in the development and implementation of local and regional groundwater protection strategies.

### 4.2.3 Education & Engagement

The Commissions initially established an Education and Outreach Program as part of the Second Generation Plan. At about the same time the member cities were required to develop education and outreach plans as part of their National Pollution Discharge Elimination System (NPDES) stormwater permits. Because these requirements were common across the cities, the member cities requested that the Second Generation Plan be designed to help them fulfill the NPDES Public Education and Outreach requirements, and this was continued in the Third Generation Plan.

The Commissions also collaborate with the Elm Creek and Bassett Creek WMOs as part of the West Metro Water Alliance (WMWA) and participate in Metro-wide education and outreach initiatives such as Blue Thumb, Watershed Partners and Northland NEMO. The WMWA collaboration is an opportunity to pool resources on larger or region-wide initiatives, such as the ongoing Watershed PREP program providing specialized classroom lessons to 4<sup>th</sup> graders and the shared education and outreach coordinator proposed jointly with Hennepin County in 2023.

Over the past decades the demographics in the watersheds reflect a growing economic, racial, ethnic, and cultural diversity. Residents living in roughly two thirds of the land area in Shingle Creek were estimated by Hennepin County to be among the most vulnerable to environmental injustice in the county based on race, income, ability, health, and social status, with parts of West Mississippi also experiencing more moderate vulnerability. As a part of this planning process, the watersheds partnered with Bassett Creek WMO to learn and start a conversation about environmental injustice, how other organizations are increasing their outreach to underserved communities, and how to begin building relationships and work toward more equitable environmental outcomes.

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The Fourth Generation Plan will continue to expand the education and outreach program to meet both the needs of the member cities' stormwater permits as well as other supplemental topics and will continue to partner with WMWA to expand joint offerings, including realizing a vision of a shared education and outreach coordinator. This expanded effort will also include renewed focus on developing more opportunities to engage all communities in the watersheds, and to require an Equity Impact Analysis be completed for all projects receiving Commission funding.

### **Goal 3: Educate and engage all stakeholders in the watersheds on surface water issues and opportunities.**

#### **Goal 3 Strategies**

- 3.a. Operate a public education and outreach program that meets the NPDES Phase II education requirements for the member cities, with special emphasis on topics such as chloride, bacteria/pet waste, and nutrient management.
- 3.b. Provide supplemental education and outreach engagement on TMDL and other topics of interest to various stakeholders, including ongoing outreach to lake associations.
- 3.c. Incorporate equity principles of diversity, equity, inclusion, and access into watershed programs and projects.

## **4.2.4 Climate Resiliency & Sustainability**

Water and natural resources are directly influenced by climate – precipitation, temperature, and other factors. Our climate is non-static: the Minnesota State Climatology Office has observed and documented changes in our climate since the late 1800's. Research suggests that the state will continue to get warmer and wetter, with more extreme rainfall events. Winters are warming, summers are more humid, and the growing season is expanding.

The highly altered and developed landscape in the watersheds limits options to prevent or mitigate impacts and increases vulnerability to changing conditions. The cumulative impact of development – paving over surfaces that previously could infiltrate precipitation and prevent flooding, loss of woods and grasslands and wetlands – is a loss of resiliency to adapt to the increasing variability in climate.

The types of changes observed in Minnesota also have the potential to more directly and negatively affect water resources. Increased daily temperatures and a longer growing season may cause shifts in lake aquatic vegetation and result in more frequent algal blooms. Runoff from more frequent, higher intensity rain events increases flows, velocities, and shear forces instreams, increasing erosion and stream instability. Biotic integrity is diminished as lake and stream aquatic species select toward those that are more tolerant to pollution or to highly variable flows.

The Fourth Generation Plan will focus on better understanding the magnitude of those impacts both locally and regionally and identifying appropriate responses. The Commissions' hydrologic and hydraulic models will be used to evaluate how future precipitation patterns may affect the extent and duration of flood events, and to identify infrastructure that may be at long-term risk of flooding. It will also be used to evaluate the impacts of potential development rules and standards changes.

Because local and regional partnerships will be necessary to combat non-static climate, the Commissions will collaborate with:

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- Hennepin County in implementing and updating its Climate Action Plan.
  - The Metropolitan Council with its Climate Vulnerability Assessment.
  - The State Climatology office to better understand and quantify impacts and potential responses.

**Goal 4: Anticipate and proactively work to withstand adverse impacts from changing environmental and climate conditions.**

Strategies

- 4.a. Model the potential impacts of a non-static climate on water resources with the best available predictive data.
- 4.b. Quantify and qualitatively assess risk and evaluate and implement responses for mitigation.
- 4.c. Collaborate with other agencies and organizations on joint efforts to manage impacts both locally and regionally.
- 4.d. Develop strategies to appropriately manage future impacts.

## **4.3 FOURTH GENERATION IMPLEMENTATION PLAN & CAPITAL IMPROVEMENT PROGRAMS**

The Commissions have successfully met nearly all their goals set forth in the Third Generation plan and have made significant progress toward protecting and improving the water and natural resources in the watersheds. The Fourth Generation Implementation Plan is for the most part simply a continuation of those projects and practices. To achieve the Fourth Generation goals set forth above the Commissions will continue to conduct a regulatory program, implement monitoring, and education and outreach, and operating programs, and undertake capital improvement projects. The following sections summarize these programs, which are described in more detail in attached appendices. Following the descriptions, table 4.6 and Table 4.9 detail the Implementation Program for each Commission and its estimated cost, and Table 4.10 describes how the programs and projects in this Implementation Program address the Problems and Issues identified in the Problem Assessment and subsequent public review and input.

The Joint Powers Agreements that govern the Commissions will expire on January 1, 2025, during the life of this Plan. The Commissions will initiate discussions with the member cities in early 2023 regarding extensions of the JPAs, with the goal of executing new agreements by the end of 2023. The Commissions have also from time to time considered formally consolidating the two organizations into one but have been unable to achieve consensus of the ten affected cities. This consolidation will be revisited during the JPA discussions; until that time, this Fourth Generation Plan assumes the two will continue to operate as two separate legal entities.

### **4.3.1 Rules and Standards, Project Reviews**

The Commissions will continue to enforce their Rules and Standards for land disturbing activities in the watersheds. In May 2022 the Commissions adopted a Minor Plan Amendment that included several revisions to the Rules and Standards to be effective October 1, 2022. The modifications conform the Rules to the most recent Minnesota General Stormwater Permit and the Minnesota Stormwater Manual, including adopting new standards for linear projects, and to make other housekeeping revisions. The



revised Rules and Standards are set forth in Appendix D. In general, the Commissions' Rules require development and redevelopment that meets the thresholds in tables 4-2 and 4-3 below to conform to the following, unless otherwise required:

- Peak runoff rates may not exceed existing rates for the 2-year, 10-year, and 100-year, 24-hour, and 100-year, 10-day critical storm events
- Must provide volume management abstraction of 1.1 inches times the amount of new and reconstructed impervious surface on site within 48 hours
- An erosion control plan using BMPs designed to the Minnesota Stormwater Manual and consistent with the NPDES General Construction Permit is required.
- Compensating storage is required to mitigate floodplain fill.
- The water quality requirement is met if the project meets the volume management requirement. If not, additional BMPs should be provided so there is no net increase in TP or TSS from pre-development land cover to post-development land cover.
- Vegetated buffer strips of a minimum 20 foot, average 30-foot width are required adjacent to wetlands and watercourses.
- Wetlands may not be drained, filled, excavated, or otherwise altered without an approved wetland replacement plan from the local government unit (LGU) with jurisdiction
- New or modified crossings of Shingle Creek must retain adequate hydraulic capacity based on the hydraulic model for the Creek.

A project review is also required for the following projects:

- Linear projects that create or fully reconstruct one acre or more of impervious surface.
- Plans of any land or site development adjacent to or within a lake, wetland, or a natural or altered watercourse as listed in the final DNR Protected Waters Inventory.
- Plans for any land or site development within the 100-year floodplain as defined by the Flood Insurance Study for the member city.
- Plans of any land development or site development regardless of size if such review is requested by a member city.

The Rules allow smaller or less complex projects to be reviewed at the City level rather than the formal Commission review process. This reduces the administrative burden for developers of small sites and allows those projects to proceed more quickly while still meeting the Commissions' requirements.

Table 4.2. Project review site size and disturbance area thresholds for all land uses except detached single-family residential.

All Land Uses Except Detached Single-Family Residential			
Development Projects (Site Size)			
City Project Review			Commission Project Review
0.5 acres to < 1 acre	≥ 1 acre to < 5 acres		≥5 acres
Abstract 1.1" runoff from all impervious surface	Meet rate, volume, and water quality requirements for the entire site		Meet rate, volume, and water quality requirements for the entire site
Redevelopment Projects (Disturbance Area)			
City Project Review			Commission Project Review
0.5 acres to < 1 acre	≥ 1.0 acres to < 5 acre		≥5 acres
Incorporate permanent water quality BMPs	<50% disturbed	Meet rate, volume, and water quality and requirements for the disturbed area	

	≥50% disturbed	Meet rate, volume, and water quality requirements for the entire site	Meet rate, volume, and water quality requirements for the entire site
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Table 4.3. Project review site size and disturbance area thresholds for detached single-family residential.

Detached Single-Family Residential Land Uses		
Development Projects (Site Size)		
City Project Review		Commission Project Review
≥ 1 acre to < 15 acres		≥15 acres
Meet rate, volume, and water quality requirements for the entire site		Meet rate, volume, and water quality requirements for the entire site
Redevelopment Projects (Disturbance Area)		
City Project Review		Commission Project Review
≥ 1 acre to < 15 acres		≥15 acres
Redevelopment projects		Redevelopment projects
<50% disturbed	Meet rate, volume, and water quality requirements for the disturbed area	Meet rate, volume, and water quality requirements for the entire site
≥50% disturbed	Meet rate, volume, and water quality requirements for the entire site	

#### 4.3.2 2023-2032 Monitoring Program

The Fourth Generation Monitoring Program, which is set forth in more detail in Appendix E, has two organizing principles: continuation of routine flow and water quality monitoring in Shingle Creek and volunteer monitoring of lake water quality; and periodic special monitoring to evaluate progress towards meeting and maintaining TMDL goals.

The Fourth Generation Plan outlines a monitoring program for the next ten years. Each year the Commissions will evaluate the proposed program and make modifications as necessary based on the most current data needs. The monitoring objectives guiding the Shingle Creek and West Mississippi monitoring program and the assessment of data are shown below.

MONITORING PROGRAM GOALS	
1.	To quantify the current status of streams and lakes throughout the watersheds in comparison to state water quality standards.
2.	To quantify changes over time, or trends, in stream and lake water quality in the watersheds.
3.	To quantify the effectiveness of implemented BMPs throughout the watersheds for the protection of water quality.
4.	To evaluate progress toward meeting TMDL load reduction and other goals.

In general, the components of the monitoring program include the following:

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- Continuation of routine flow and water quality monitoring on Bass Creek (BCP), Shingle Creek at SC-0 (Webber Park), and SC-3 (Brooklyn Boulevard), and continued partnership with the USGS to maintain the real-time monitoring station at Queen Avenue in Minneapolis. Longitudinal DO profiles will be obtained periodically on Shingle and Bass Creeks.
  - Routine flow and water quality monitoring on Mattson Brook and major Mississippi River outfalls on a rotating basis.
  - Fish and macroinvertebrate collections on Shingle and Bass Creeks approximately every five years.
  - Continuation of the partnership with Hennepin County Environment and Energy to obtain macroinvertebrate collections by student volunteers each year through the RiverWatch program.
  - Intensive lake surface and water column water quality monitoring to support implementation.
  - Continuation of the partnership with the Metropolitan Council to conduct lake surface water quality monitoring by volunteers every two to three years through the Citizen Assisted Monitoring Program (CAMP), particularly on delisted lakes.
  - Preparation of an annual Water Quality Report presenting current water quality and trends, and reporting water quality data to the state's EQLS database.

The schedule and monitoring program set forth in Appendix E is intended to collect more detailed and intensive data so that every five years the Shingle Creek Commission can evaluate progress toward meeting and maintaining TMDL goals. In each TMDL Implementation Plan the Commission agreed to undertake a monitoring program and conduct such a progress review every five years, and to adjust the Implementation Plan as necessary.

### **4.3.3 2023-2032 Education & Outreach Program**

The Commissions will continue to operate an Education and Public Outreach (E & O) program that helps the member cities meet their NPDES Permit Public Education and Outreach Minimum Measure. In particular, the E & O program will emphasize, but not be limited to, topics such as chloride, nutrient, and bacteria/pet waste management. The Commissions will continue to partner with WMWA on broader E & O initiatives of joint interest, including the Watershed PREP program of outreach to elementary school age children and their families. In addition, the Commissions will develop and deliver additional programming, either stand-alone or through WMWA, directed specifically toward adults, such as lake associations and small business owners, and to continue implementation of programming developed by the Hennepin County Chloride Initiative (HCCI).

In 2023-2024 five WMOs in Hennepin County will share a two-year, limited duration E & O coordinator position with Hennepin County by dedicating a portion of their Watershed-Based Implementation Funding (WBIF) and contributing funds budgeted for general WMWA activities. This coordinator will be a fulltime employee who dedicates half of their time to Watershed Education and Outreach. The coordinator will work on specific programming needs but will also be available to provide more general E & O programming. The Commissions will continue to work with WMWA, the County and other interested parties to help develop, fund and implement their long-term vision of a shared, full-time E & O coordinator delivering a broad array of programming similar to the East Metro Water Resource Education Program (EMWREP).

In addition, as the population in the watersheds continues to diversify, there is a need to rethink some of the education and outreach approaches taken until now, to bring into the discussion questions of environmental justice and equity and inclusion. Analysis done for the Hennepin County Climate Action Plan revealed that about 2/3 of the land area of Shingle Creek and parts of West Mississippi are home to diverse communities that are the most vulnerable to environmental injustice based on six factors: race, income, language, ability, health, and social status.

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In developing this Plan, the Commissions partnered with the Bassett Creek WMO and Hennepin County on a workshop to start several conversations about environmental justice issues facing our communities. Some of the key takeaways are 1) the work is most successful when all parties spend time to build relationships and build trust, which can be resource-intensive and time consuming but is ultimately rewarding; and 2) environmental justice must be intentional and can challenge us to look at our actions in a new and sometimes uncomfortable way. One challenge is the extent to which our water resources work can move beyond a strict “where the science says” approach to “where we can mitigate disproportionate impacts.”

Efforts at outreach to these vulnerable communities to date at the Commission level have been limited to partnerships with Metro Blooms to help fund workshops and hands-on BMP installations with multi-family communities, and WMWA’s ongoing Watershed PREP work with elementary students, which increasingly are drawn from vulnerable communities. The Commissions will continue to work with its partners, including member cities who have been doing day to day outreach to their residents, to expand those efforts to help meet the needs of all the communities in the watersheds.

#### **WATERSHED EDUCATION AND PUBLIC OUTREACH PROGRAM GOALS**

1. All members of the community become knowledgeable about the water resources in the watersheds and take positive action to protect and improve them.
2. All members of the community have a general understanding of watersheds and water resources and the organizations that manage them.
3. All members of the community have a general understanding of the Impaired Waters in the watersheds and take positive actions to implement TMDL requirements.

*Implementation Strategies.* The Education and Outreach Committee will annually make a recommendation for education and outreach activities for the coming year. The EPOC will rely on the following and other strategies to implement the program and achieve the Plan’s education and outreach goals:

- Participate in the West Metro Water Alliance (WMWA) to promote interagency cooperation and collaboration, pool resources to undertake activities in a cost-effective manner, and promote consistency of messages
- Continue working with WMWA to implement a long-term vision for a dedicated shared education and outreach specialist
- Supplement WMWA activities as necessary to meet the unique needs of the watersheds
- Partner with other organizations to enhance engagement with underrepresented groups
- Require the preparation of a Community Engagement Plan for each proposed, Commission-funded improvement, including an Equity Impact Analysis
- Maintain an active Education and Outreach Committee with representatives from all member cities to advise the Commissions and to assist in program development and implementation
- Use the Commissions’, member cities’, and educational partners’ websites, social media and newsletters, and local newspapers and cable TV to share useful information to stakeholders on ways to improve water quality
- Provide opportunities for the public to learn about and participate in water quality activities such as tabling at community events and volunteer monitoring
- Each year review and modify or develop and prioritize education and outreach activities and strategies for the coming two years

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#### 4.3.4 TMDL Implementation

The Shingle Creek Commission took on responsibility for certain implementation activities in the Shingle Creek chloride, biotic integrity, and dissolved oxygen TMDLs and the lakes TMDLs. Those include:

- Coordination of activities and information-gathering.
- Monitoring Shingle and Bass Creeks for the impairment parameters - chloride, dissolved oxygen, and fish and macroinvertebrates, and the lakes for TP, chl-a, and Secchi depth.
- Reporting water quality data to the state's EQulS database.
- Preparing an annual Water Quality Report that provides current data and analyzes trends for the impairment parameters.
- Maintaining, periodically reviewing, and updating, and enforcing rules and standards for development and redevelopment projects that require treatment to reduce TP and TSS in runoff and to increase infiltration to reduce runoff volume.
- Providing education and outreach to a variety of stakeholders regarding stewardship of water resources and load and volume reduction strategies.
- Promoting and supporting installation of demonstration projects.
- Continue conducting a progress review approximately every five years following TMDL approval to evaluate progress and consider any necessary additional implementation strategies. Use a tiered approach to prioritize TMDLs for review.

Those actions are incorporated into this Plan as part of the monitoring plan, education and outreach plan, general operations, and Rules and Standards.

The member cities have taken on responsibility in the TMDL Implementation Plans for undertaking capital projects and activities to reduce pollutant loading. Those actions are not reflected in this Plan. The Local Plan Content requirements set forth in Section 4.4 of this Plan require the member cities to "Show how the city will take action to achieve the load reductions and other actions identified in and agreed to in the TMDL Implementation Plan."

#### 4.3.5 Other Activities

##### Subwatershed Assessments

Subwatershed assessments are intensive studies of small areas of land to identify the best locations for small Best Management Practices (BMPs) such as rain gardens, tree trenches, and bio infiltration basins. They are usually completed in areas that are already developed and have little or no stormwater treatment, and where it is not practical to construct a large BMP such as a stormwater pond. The Commissions and cities have undertaken a number of these assessments, which tend to be focused on areas where redevelopment or street reconstruction is expected to occur, or around priority waterbodies. These assessments often lead to capital projects such as the Becker Park Infiltration Project initially identified in the Crystal Shopping Center SWA, or to smaller, opportunistic cost-share BMPs completed as part of street or other improvement projects. Subwatershed assessments completed during the Third Generation Plan are shown in Table 4.4.

Table 4.4. Subwatershed assessments completed under the Third Generation Plan.

Subwatershed Assessment	Receiving Water	City
<i>Shingle Creek Watershed</i>		
Crystal Lake Drainage Area	Crystal Lake	Portion within Robbinsdale
Crystal Shopping Center	Upper Twin Lake	Crystal

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Pike Lake Drainage Area	Pike Lake	Portion Within Plymouth
Pike Lake Drainage Area*	Pike Lake	Portion Within Maple Grove
Bass Lake Drainage Area**	Bass Lake	Plymouth
Minneapolis	Shingle Cr, Crystal Lk, Ryan Lk	All of Mpls in Shingle Cr WMO
<i>West Mississippi Watershed</i>		
TH 169 Redevelopment Area	Mississippi River	Champlin
Evergreen Park Area	Mississippi River	Brooklyn Center

\*Completed by the city of Maple Grove

\*\*Completed by the City of Plymouth

#### Eagle Lake Subwatershed Assessment.

Eagle and Pike Lakes are Impaired Waters, with Pike Lake upstream of Eagle Lake and discharging to it through a short channel. Subwatershed assessments have been completed for the Pike Lake drainage area, but not for the area tributary to Eagle Lake. Some of that drainage area receives stormwater treatment, but much has little to no treatment. This subwatershed assessment will focus on identifying potential additional BMPs or options to improve the efficiency and/or effectiveness of existing BMPs. In addition, the outflow of the Impaired Cedar Island Lake is conveyed by storm sewer and outlets into a wetland just upstream of Eagle Lake. This SWA will evaluate the need for and potential effectiveness of adding treatment to that discharge to limit impacts to Eagle Lake.

#### Gaulke Pond Subwatershed Assessment

Gaulke Pond is in the City of Crystal, south of 41st Avenue North and east of Douglas Drive North and is the most downstream of a series of four ponds (including Memory Pond, Brownwood Pond, and Hagemeister Pond) that collect runoff from a 905-acre mixed residential, institutional, and commercial watershed draining portions of New Hope, Crystal, and Robbinsdale. The pond system is landlocked and depends on pumps to manage water levels and minimize flooding. In 2021-2022 the Commission partnered with those cities to complete the Gaulke Pond & Crystal Lake Pump Operating Plan, which developed a strategic operational plan to coordinate overflow pumping from the pond system and nearby landlocked Crystal Lake into downstream Ryan Lake. This subwatershed assessment would revisit that subwatershed to evaluate options for water quality BMPs to protect both the ponds and the lake downstream.

#### Feasibility Studies

The Commissions have undertaken a number of feasibility studies to understand and define potential improvement projects. These may include lake diagnostic studies to assess the feasibility of a lake alum or other internal load project, or field work to establish the magnitude and extent of stream restoration needs on Shingle Creek or one of the other tributaries in the watersheds. the following actions have been identified for completion during the life of this Fourth Generation Plan. Additional actions may be identified and incorporated into future annual work plans.

#### Eagle Lake Internal Load Feasibility Study

In conjunction with the proposed subwatershed assessment of opportunities in the subwatershed, this feasibility would assess conditions internally in Eagle Lake, looking at the game and rough fish

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communities, aquatic vegetation, and potential for sediment release of nutrients. The outcome will be a blueprint for an Eagle Lake Management Plan that would be an integrated roadmap of steps to manage water quality and ecological integrity in the lake.

#### Bass Creek Restoration Feasibility, TH 169 – 63<sup>rd</sup> Ave N

This feasibility study would assess the condition of 2,700 linear feet of Bass Creek from TH 169 in New Hope through Cavelle Park to 63<sup>rd</sup> Ave N in Brooklyn Park and the potential for stabilization and restoration of the channel.

#### Shingle Creek Natural Channel Feasibility, Brookdale Park

This feasibility report would assess options for restoring a natural channel design to about 4,900 linear feet of Shingle Creek in Brookdale Park in Brooklyn Park, from the downstream end of the Connections II project to Xerxes Avenue N. Aerial photos show that historically the stream was highly meandered through this area before being channelized to promote adjacent development. A remnant of that alignment still exists on the south side of the stream where a backwater channel flows through a series of small ponds and then back to the main channel. This project is an opportunity to restore access to the old floodplain, enhance habitat and refugia, and add back sinuosity and channel complexity. Completing this project would create a continuous 3.4 miles of restored urban stream corridor, extending from West Broadway in Brooklyn Park downstream to the Palmer Lake Nature Area.

### Climate Resiliency & Sustainability Actions

As noted in Section 4.2.4, water and natural resources are directly influenced by climate, and in recent years our climate has become non-static. Research by the Minnesota State Climatology Office and others suggests that the state will continue to get warmer and wetter, with more extreme rainfall events. Winters are warming, summers are more humid, and the growing season is expanding. The long-term prospect is for more frequent, intense storms, higher rates and volumes of runoff, and increased potential for flooding.

Many of the cities in the watersheds developed prior to the inception of the Commissions in 1984, with few requirements to control the volume or rate of stormwater runoff. Infrastructure also tends to be older and originally designed to convey the 2-5-year rain event whereas newer suburbs design to at least the 10-year event. This means increasingly intense precipitation will put those older communities at higher risk. The highly altered and developed landscape in the watersheds limits options to prevent or mitigate impacts and increases vulnerability to changing conditions. The cumulative impact of development – paving over surfaces that previously could infiltrate precipitation and prevent flooding, loss of woods and grasslands and wetlands – is a loss of resiliency to adapt to the increasing variability in climate.

Not only will this stress existing infrastructure, that stress will fall disproportionately on communities that are less resilient to climate impacts. The MPCA Interactive Environmental Justice Mapping Tool indicates that approximately half of the Shingle Creek watershed falls within areas with high concentrations of poverty and or percentage of BIPOC residents. The Hennepin Climate Action Plan has determined that nearly 2/3 of the Shingle Creek watershed and parts of West Mississippi are home to residents that score high on the Human Vulnerability Index. This index takes into account not only race/ethnicity and income characteristics, but also level of education, employment, health metrics, English proficiency, and disability.

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The Fourth Generation Plan will focus on better understanding the magnitude of those impacts both locally and regionally and identifying appropriate responses. Identifying those areas more at risk for future flooding well in advance of that change will provide the communities with a head start at planning and being proactive rather than reactive. While the following actions have been identified for completion during the life of this Fourth Generation Plan, as the potential impacts of changing climate are better understood, additional actions may be identified and incorporated into future annual work plans.

#### Climate Resilience H & H Model Scenario Assessment

The HUC8 Hydrologic and Hydraulic (H & H) model update completed in 2021-2022 updated flood risk areas based on current climate and weather patterns. As we continue to experience a non-stationary climate, this model provides an opportunity to explore the potential for flood risk 50-100 years out and to identify critical infrastructure for protection before the need arises. The Commissions will undertake a Climate Resilience H & H Scenario Assessment as follows:

1. The State Climatology Office suggests a reasonable proxy for the 2050-2060 critical event is the 90<sup>th</sup> percentile Atlas 14 precipitation depth, or the 500-year event depth, which in many cases is very close to the 90<sup>th</sup> percentile. This assessment will conduct additional model runs using the selected depth and map the resulting flood risk areas.
2. The NOAA will later this decade establish new Atlas 15 standards that will incorporate estimates of future precipitation probabilities. These data may be available to assist in this assessment.
3. GIS and field surveys will be used to identify critical public and private infrastructure that could be impacted with an emphasis on structures, crossings, and road flooding. The list will be based on impacts to public health and safety and identify potential improvements to increase resiliency.
4. The Assessment will include policy and technical guidance to guide development or redevelopment in those areas, including the potential for revisions to the Commissions' development Rules and Standards.

#### Climate Resilience Working Group

Because local and regional partnerships will be necessary to combat non-static climate, the Commissions will collaborate with other agencies and groups to share information, better understand potential impacts, and share solutions to these challenging issues. The Commissions will partner with Hennepin County and other interested parties to meet periodically to discuss common issues and approaches as all grapple with these questions.

### 4.3.6 Commission Self-Assessment

A periodic robust and frank self-assessment is necessary to ensure that organizations stay on track to achieve goals. Each year for their annual report the Commissions review their activities over the previous year and set a work plan for the coming year. This review has been only indirectly tied to the management plan goals.

During this Fourth Generation Plan, the Commissions will annually review progress towards goals. This self-assessment will use a matrix such as Table 4.5 below to systematically review and evaluate progress towards goals. This matrix will also be used to set each year's work plan as well as provide a "heads up" to member cities about future years' needs. This self-assessment will become part of the Commissions' Annual Reports.



Table 4.5. Conceptual self-assessment matrix.

Goal	Actions Taken this Past Year	Actions Taken to Date	Additional Actions to Achieve Goal	Schedule, Responsible Party(ies), Cost and Funding
1.a. Manage the surface water resources of the watershed to meet or exceed state standards.	<i>To be completed annually</i>	<i>To be completed annually</i>	<i>To be completed annually</i>	<i>To be completed annually</i>
1.a. Implement load reduction actions sufficient to achieve state water quality standards in Eagle, Crystal, and Middle Twin Lakes.	<i>To be completed annually</i>	<i>To be completed annually</i>	<i>To be completed annually</i>	<i>To be completed annually</i>
...	...	...	...	...

### 4.3.7 Capital Improvement Program

The Commissions maintain a Capital Improvement Program (CIP), whereby the Commissions share in the cost of significant capital projects. That CIP is reviewed annually, which often requires adoption of Minor Plan Amendments to revise or add to the Program. In addition, the Commissions operate three other programs to assist cities and private property owners with smaller BMPs: City Cost-Share, Partnership Cost-Share, and the newest program adopted in 2022, the Project Maintenance Fund.

#### Capital Improvements Program

The Commissions share the cost of watershed-priority capital improvements and demonstration projects through the Commissions' Capital Improvements Program (CIP). High-priority watershed capital improvements are those activities that go above and beyond general or routine city management activities to provide a significant improvement to the water resources in the watershed. The CIP is guided by a Cost Share Policy that establishes the basis for and amount of Commission contribution to qualifying projects.

High priority activities that result in Wasteload Allocation reductions toward a TMDL, help solve a regional flooding problem, or are otherwise determined by the Technical Advisory Committee (TAC) and Commissions to be high priority are eligible to receive up to 25 percent of the final improvement cost in Commission cost-share, funded by the county ad valorem tax levied on all property in the watershed. The balance of the improvement cost, less any grant or other funds received, must be funded by the local government(s) participating in or benefiting from the improvement. The Commissions' minimum share is \$50,000. There is no maximum share; the maximum is limited by the amount the Commission is willing/able to certify as a levy.

Eligible improvements under the CIP Cost-Share Policy include both structural and nonstructural activities that reduce pollutant loading, manage runoff volume, or address non-localized flooding. Routine maintenance or localized improvements are not eligible for cost share. Capital equipment that has been demonstrated to reduce loading of TMDL pollutants may be eligible under certain conditions as set forth in the Policy.

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The capital cost of activities addressing TMDL Load Allocation reductions and projects of watershed-side benefit may be funded 100 percent by the ad valorem tax levy. These types of activities include but are not limited to:

- Lake Internal Load Reduction Actions
- Stream Internal Load Reduction Activities
- Non-TMDL Parameters (actions required by TMDLs not associated with a pollutant for which a numerical reduction of improvement can be specified)
- Other Watershed-Benefiting Improvements as Recommended by the TAC

### City and Partnership Cost-Share Programs

The Commissions each maintain two programs to help fund the cost of smaller BMP projects, typically costing less than \$100,000. Each Commission annually levies \$50,000 – 100,000 to fund these types of projects. The City Cost Share Program will provide 50% cost share up to \$50,000 per project for voluntary BMPs installed with City projects, and up to 100% cost share up for voluntary BMP projects on private property. In both cases, the BMPs must provide for improvements above and beyond those required by any permit.

### Project Maintenance Fund

The Commissions adopted a Minor Plan Amendment in 2022 adding a Project Maintenance Fund to the CIP. Maintenance, repair, or replacement of Commission-funded projects is often ongoing and necessary to continue providing water quality benefits in the watershed. The Commissions levy up to \$50,000 per year to complete maintenance activities to maintain water quality benefits following Commission-led projects. This may include activities such as annual rough fish maintenance management; fish barrier cleaning, repair, and maintenance; whole-lake invasive aquatic vegetation management treatments performed for water quality; alum treatment touch-up; in-lake vegetation transplanting efforts; and research BMP maintenance (e.g., biochar and iron-enhanced sand filters constructed under Watershed projects).

## 4.3.8 Costs and Funding Sources

Tables 4.6 and 4.7 below summarize the estimated annual operating expenses for the two watersheds. The primary source of funding for these programs is the annual member assessment as described in Section 3.2.1 above. The Commissions do recoup a part of the cost of performing project reviews through application fees, which are periodically reviewed and adjusted.

Tables 4.8 and 4.9 set forth the Implementation Plan of capital projects, cost-share programs, special studies, and project maintenance activities. More information regarding the proposed actions in the Implementation Plan can be found in Appendix E, which describes the proposed lake and stream management plans in more detail.



Table 4.6. Shingle Creek Fourth Generation Plan Estimated Budget and Revenues.

Shingle Creek Operating Budget and Revenues	2023	2024	22025	2026	2027	2028	2029	2030	2031	2032
<b>Budget</b>										
Administration	85,000	87,550	90,180	92,890	95,680	98,550	101,510	104,560	107,700	110,930
Engineering	98,000	100,940	103,970	107,090	110,300	113,610	117,020	120,530	124,150	127,870
Monitoring	90,900	93,630	96,440	99,330	102,310	105,380	108,540	111,800	115,150	118,600
Legal & Miscellaneous	29,700	30,000	30,000	31,000	31,000	32,000	32,000	33,000	33,000	34,000
Education	28,500	29,360	30,240	31,150	32,080	33,040	34,030	35,050	36,100	37,180
Studies	21,650	22,000	22,000	22,000	23,500	23,500	23,500	25,000	25,000	25,000
Project Reviews	31,500	32,000	32,000	33,000	33,000	34,000	34,000	35,000	35,000	35,000
<b>Total</b>	<b>385,250</b>	<b>395,480</b>	<b>404,830</b>	<b>416,460</b>	<b>427,870</b>	<b>440,080</b>	<b>450,600</b>	<b>464,940</b>	<b>476,100</b>	<b>488,580</b>
<b>Revenues</b>										
Application Fees	15,000	15,000	17,500	17,500	19,000	19,000	20,000	20,000	21,000	21,000
Member Assessments	370,000	380,230	387,080	398,710	408,620	420,830	430,350	444,690	454,850	467,330
Interest	250	250	250	250	250	250	250	250	250	250
<b>Total</b>	<b>385,250</b>	<b>395,480</b>	<b>404,830</b>	<b>416,460</b>	<b>427,870</b>	<b>440,080</b>	<b>450,600</b>	<b>464,940</b>	<b>476,100</b>	<b>488,580</b>
Assessment Increase		2.7%	1.8%	2.9%	2.4%	2.9%	2.2%	3.2%	2.2%	2.7%

Table 4.7. West Mississippi Fourth Generation Plan Estimated Budget and Revenues.

West Mississippi Operating Budget and Revenues	2023	2024	22025	2026	2027	2028	2029	2030	2031	2032
<b>Budget</b>										
Engineering	32,300	33,270	34,270	35,300	36,360	37,450	38,570	39,730	40,920	42,150
Administration	36,000	37,080	38,190	39,340	40,520	41,740	42,990	44,280	45,610	46,980
Project Reviews	26,500	27,000	27,000	28,500	28,500	29,000	29,000	30,000	30,000	30,000
Monitoring	32,100	33,060	34,050	35,070	36,120	37,200	38,320	39,470	40,650	41,870
Legal & Miscellaneous*	*20,900	21,500	21,500	21,500	22,500	22,500	23,000	23,000	24,000	24,000
Education	28,500	29,360	30,240	31,150	32,080	33,040	34,030	35,050	36,100	37,180
<b>Total</b>	<b>176,300</b>	<b>181,270</b>	<b>185,250</b>	<b>190,860</b>	<b>196,080</b>	<b>200,930</b>	<b>205,910</b>	<b>211,530</b>	<b>217,280</b>	<b>222,180</b>
<b>Revenues</b>										
Application Fees	20,000	20,500	21,000	21,500	22,000	22,000	23,000	23,000	24,000	25,000
Member Assessments	156,200	160,670	164,150	169,260	173,980	178,830	182,810	188,430	193,180	197,080
Interest	100	100	100	100	100	100	100	100	100	100
<b>Total</b>	<b>176,300</b>	<b>181,270</b>	<b>185,250</b>	<b>190,860</b>	<b>196,080</b>	<b>200,930</b>	<b>205,910</b>	<b>211,530</b>	<b>217,280</b>	<b>222,180</b>
Assessment Increase		2.8%	2.1%	3.0%	2.7%	2.7%	2.2%	3.0%	2.5%	2.0%

Table 4.8. Shingle Creek Fourth Generation Plan Implementation Plan.

IMPLEMENTATION PROGRAM	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
<b>Watershed-wide Programs</b>										
<i>City Cost Share Program</i>	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Commission Contribution	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Local Contribution	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
<i>Partnership Cost Share Program</i>	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Commission Contribution	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Local Contribution	0	0	0	0	0	0	0	0	0	0
<i>Project Maintenance Fund</i>	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Commission Contribution	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Local Contribution	0	0	0	0	0	0	0	0	0	0
<b>Stream Projects</b>										
<i>Bass Creek TH 169 to 63rd Avenue</i>	500,000									
Commission Contribution	500,000									
Local Contribution	0									
<i>Shingle Creek Brookdale Park Natural Channel</i>	1,250,000									
Commission Contribution	1,250,000									
Local Contribution	0									
<i>Minneapolis Shingle Creek Stream Restoration</i>		400,000			300,000					
Commission Contribution		400,000			300,000					
Local Contribution		0			0					
<i>Shingle Creek or Bass Creek Restoration Project</i>								400,000		
Commission Contribution								400,000		
Local Contribution								0		
<b>Eagle, Pike, and Cedar Island Lakes</b>										
<b>Capital Projects</b>										
<i>Lake Internal Load Improvement Project-Eagle/Pike</i>	30,000	170,000								
Commission Contribution	30,000	170,000								
Local Contribution	0	0								
<i>Lake Internal Load Improvement Project-Cedar Island</i>						30,000	170,000			
Commission Contribution						30,000	170,000			
Local Contribution						0	0			
<i>Pike Creek Stabilization</i>	395,000									
Commission Contribution	105,000									
Local Contribution	290,000									

IMPLEMENTATION PROGRAM	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
<b>Maintenance Projects</b>										
Aquatic Vegetation Mgmt										
Commission Contribution			15,000	15,000					15,000	15,000
Local Contribution										
<b>Special Studies</b>										
Subwatershed Assessment and Internal Load Feasibility- Eagle/Pike Lake	50,000									
Commission Contribution	20,000									
WBIF Contribution	30,000									
<b>Twin and Ryan Lakes</b>										
<b>Capital Projects</b>										
Wetland 639W Weir Wall Enhancement			100,000							
Commission Contribution			100,000							
Local Contribution			0							
Lake Internal Load Project						200,000				
Commission Contribution						200,000				
Local Contribution						0				
<b>Maintenance Projects</b>										
Modify France Ave Fish Barrier										
Commission Contribution	8,000									20,000
Local Contribution										
Carp Management										
Commission Contribution	30,000	30,000			25,000		25,000		25,000	
Local Contribution										
Aquatic Vegetation Mgmt										
Commission Contribution						15,000				
Local Contribution										
<b>Special Studies</b>										
Gaulke Pond Subwatershed Assessment	30,000									
Commission Contribution	0									
WBIF Contribution	30,000									
<b>Bass, Schmidt, and Pomerleau Lakes</b>										
<b>Capital Projects</b>										
New Project										
Commission Contribution										
Local Contribution										

IMPLEMENTATION PROGRAM	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
<i>New Project</i>										
Commission Contribution										
Local Contribution										
<b>Maintenance Projects</b>										
<i>Aquatic Vegetation Mgmt</i>										
Commission Contribution	12,000	10,000		10,000		10,000		10,000		10,000
Local Contribution										
<b>Crystal Lake</b>										
<b>Capital Projects</b>										
<i>New Project</i>										
Commission Contribution										
Local Contribution										
<i>New Project</i>										
Commission Contribution										
Local Contribution										
<b>Maintenance Projects</b>										
<i>Aquatic Vegetation Mgmt</i>										
Commission Contribution			10,000	10,000	10,000			10,000	10,000	
Local Contribution										
<i>Rough Fish Mgmt</i>										
Commission Contribution			25,000		25,000		25,000	25,000		
Local Contribution										
<b>Meadow, Magda, and Success Lakes</b>										
<b>Capital Projects</b>										
<i>New Project</i>										
Commission Contribution										
Local Contribution										
<i>New Project</i>										
Commission Contribution										
Local Contribution										
<b>Maintenance Projects</b>										
<i>Aquatic Vegetation Mgmt</i>										
Commission Contribution			10,000			25,000				
Local Contribution			0			0				
<i>Rough Fish Mgmt</i>										
Commission Contribution										
Local Contribution										

IMPLEMENTATION PROGRAM	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
<b>Special Study-Magda Subwatershed Assessment</b>									30,000	
Commission Contribution									30,000	
Local Contribution									0	
<b>Stormwater BMP Projects</b>										
<b>Capital Projects</b>										
<b>Maple Grove Pond P57</b>		648,000								
Commission Contribution		162,000								
Local Contribution		486,000								
<b>Maple Grove Pond P33</b>				574,000						
Commission Contribution				143,500						
Local Contribution				430,500						
<b>Minneapolis Flood Area 5 Water Quality Projects</b>			6,000,000							
Commission Contribution			250,000							
Local Contribution			5,750,000							
<b>Maple Grove Pond P55</b>										855,000
Commission Contribution										213,800
Local Contribution										641,200
<b>New Project</b>										
Commission Contribution										
Local Contribution										
<b>Other</b>										
<b>Special Study-Flood Resiliency Modeling</b>	30,000									
Commission Contribution	30,000									
Local Contribution	0									
<b>5th Generation Plan</b>	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Commission Contribution	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Local Contribution	0	0	0	0	0	0	0	0	0	0
<b>TOTAL IMPLEMENTATION PLAN</b>	<b>2,505,000</b>	<b>1,528,000</b>	<b>6,410,000</b>	<b>884,000</b>	<b>610,000</b>	<b>940,000</b>	<b>480,000</b>	<b>710,000</b>	<b>340,000</b>	<b>1,165,000</b>



Table 4.9. West Mississippi Fourth Generation Plan Implementation Plan

IMPLEMENTATION PROGRAM	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
<i>City Cost Share Program</i>	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Commission Contribution	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Local Contribution	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
<i>Partnership Cost-Share BMP Projects</i>	100,000	100,000	100,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Commission Contribution	100,000	100,000	100,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Local Contribution	0	0	0	0	0	0	0	0	0	0
<i>New Project</i>										
Commission Contribution										
Local Contribution										
<i>New Project</i>										
Commission Contribution										
Local Contribution										
<i>Champlin Woods Trail Rain Gardens</i>	180,000									
Commission Contribution	45,000									
Local Contribution	135,000									
<i>New Project</i>										
Commission Contribution										
Local Contribution										
<i>Special Study-Flood Resiliency Modeling</i>	30,000									
Commission Contribution	30,000									
Local Contribution	0									
<b>TOTAL IMPLEMENTATION PLAN</b>	<b>410,000</b>	<b>200,000</b>	<b>200,000</b>	<b>150,000</b>	<b>150,000</b>	<b>150,000</b>	<b>150,000</b>	<b>150,000</b>	<b>150,000</b>	<b>150,000</b>

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### 4.3.9 Addressing Identified Problems & Issues

As noted above, this planning process revealed a few problems and issues to be considered in this Fourth Generation Watershed Management Plan. Table 4.10 below repeats the problems and issues set forth in Table 4.1 at the beginning of this report section and describes how each were addressed in this Implementation Plan.

Table 4.10. Actions in this Plan addressing the identified problems and issues.

Problem	Actions in 4 <sup>th</sup> Generation Plan
Continued progress toward meeting water quality goals	The CIP includes several capital projects to reduce watershed and internal load to impaired lakes and streams. The monitoring program is designed to more intensively evaluate progress toward meeting those and documenting improvement. For those waterbodies now meeting goals, the less intensive monitoring program is designed to show continued maintenance.
More community engagement and education with adults, including with lake associations	The Commissions will continue to work with WMWA and other partners to expand that outreach, including working toward a vision of a full-time shared Education and Outreach Coordinator.
Continue to coordinate with DNR, MPCA, and cities	The monitoring program is designed to dovetail with and complement the DNR and MPCA monitoring program. The recent Bass Lake Vegetation Transplant Project was done in coordination and with assistance from the DNR. The Commission will continue to actively involve the DNR and PCA in watershed activities.
Make progress toward eliminating the chloride impairment	Continue meeting chloride TMDL implementation requirements and work with WMWA and cities to implement programs developed by the HCCI
Increased community engagement with BIPOC and other underrepresented residents	The Commissions will continue to work with WMWA and other partners to expand that outreach, including working toward a vision of a full-time shared Education and Outreach Coordinator. The Commissions will continue to partner with Metro Blooms to provide outreach to multi-family communities.
Need for a climate vulnerability assessment	Includes completion of a study that would use the H & H model to predict the impacts of various future precipitation scenarios on flood extent and identify potentially vulnerable infrastructure.
Continue to complete subwatershed assessments to identify BMPs in older areas of the watersheds	Includes completion of at least two subwatershed assessments in priority areas: the Gaulke Pond subwatershed and the Eagle Lake subwatershed.

## 4.4 IMPACT ON LOCAL GOVERNMENTS

Governmental units having land use planning and regulatory responsibility are required by statute to prepare or amend their local water management plans no sooner than two years prior to the required update of their 10 Year Comprehensive Plan. Local plan content is driven primarily by Minnesota Rules 8410 and must include a ten year capital improvement program and implementation plan to bring the local water management plan into conformance with the Commissions' Plan.

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#### **4.4.1 Local Plan Content**

Local water management plans adopted by member cities pursuant to Minnesota Statutes, Section 103B.235 shall be consistent with the Fourth Generation Watershed Management Plan. Local plans must comply with Minnesota Statutes, Section 103B.235 and Minnesota Rules 8410 regarding local plan content. The Commissions strongly encourage communities to develop the scope of their local plan with assistance from the Commissions. At a minimum, local water management plans are required to do the following:

- Update the existing and proposed physical environment and land use. Information from previous plans that has not changed may be referenced and summarized but does not have to be repeated. Local plans may adopt relevant sections of this Plan by reference unless the member city has more recent information, such as revised land use figures and data.
- Update the existing and proposed hydrology and provide subwatershed, storm drainage system, and installed BMP figures and shapefiles.
- Explain how the goals and policies, and rules and standards established in the WMP will be implemented at the local level.
- Show how the member city will take action to achieve the load reductions and other actions identified in and agreed to in TMDL Implementation Plans, including identifying known upcoming projects including street reconstruction projects that will provide opportunities to include load and volume reduction BMPs.
- Explain how the City will implement the City Review project review requirements of the revised Rules and Standards.
- Update existing or potential water resource related problems and identify nonstructural, programmatic, and structural solutions, including those program elements detailed in Minnesota Rules 8410.0100, Subp. 1 through 6.
- Set forth an implementation program including a description of adoption or amendment of official controls and local policies necessary to implement the Rules and Standards; programs; policies; and a capital improvement plan.

#### **4.4.2 Local Plan Review**

Each member city shall submit its proposed water management plan to the respective Commission(s) and the Metropolitan Council for review before adoption by its governing body. The Commissions and the Metropolitan Council will review and approve or suggest changes to the local water management plan. The Metropolitan Council review period is 45 days and the SCWM WMC review period is 60 days after plan receipt.

### **4.5 PLAN REVIEW, UPDATE, & REVISION**

This Watershed Management Plan provides direction for Shingle Creek and West Mississippi Watershed Management Commission activities through the year 2032. The Commissions may initiate amendments to the Plan at any time. The Commissions intend that the Plan provide a flexible framework for managing the watersheds.

The Commissions annually review the Implementation Plan and Capital Improvements Program (CIP), and revisions to the CIP may require future minor or major plan amendments. The Implementation Plan sets forth activities and costs for the next 10 years, and a future plan amendment will likely be necessary to describe activities in more detail as projects and plans develop.

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### **4.5.1 Amendment Procedures**

All amendments to the Plan except minor amendments shall adhere to the full review and process set forth in Minnesota Statutes 103B.231, and this section. Each Commission shall adopt proposed major plan amendments upon their approval by the Board of Water and Soil Resources (BWSR) in accordance with Minnesota Statutes 103B.231.

The amendment procedure for minor plan amendments shall be in accordance with Minnesota Rules 8410.0140 as such rules now exist or as subsequently amended.

Neither a minor nor a major plan amendment will be required for the following situations:

1. If projects included in the approved CIP are implemented in a different year than shown.
2. When a capital project is included in the approved Capital Improvement Program and the Commission's share of an updated cost estimate does not exceed 125 percent of the Commission's share shown on the CIP, as adjusted by the Construction Cost Index as published by the Engineering News Record.
3. When a capital project is included in the approved Capital Improvement Program and the Commission's share of an updated cost estimate is less than the Commission's share shown on the CIP, as adjusted by the Construction Cost Index as published by the Engineering News Record. However, the Commission will review such projects to evaluate the extent to which the original project objectives are being met.

### **4.5.2 Form of the Amendments**

Unless the entire document is reprinted, all amendments adopted by the Commissions must be printed in the form of replacement pages for the Plan, each page of which must conform to the following:

1. On draft amendments being considered, show deleted text as stricken and new text underlined.
2. Be renumbered as appropriate.
3. Include the effective date of the amendment.