

Shingle Creek and West Mississippi WMC Third Generation Plan Assessment

Third Generation Plan Activities

Management Plan Amendments

The Third Generation Plan has been amended twelve times since 2013 (Table 1). 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. Atlas 14 reflects the best and most complete data on rainfall depths and patterns based on an extensive period of record. 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. A third revision 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. Shingle Creek and West Mississippi Third Generation Plan record of plan revisions.

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
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 capital improvements policy 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 to WM Partnership Cot Share program,

Regulatory Program

The Commissions do not issue permits but do require development and redevelopment to meet requirements for runoff rate control, treatment, and volume management. Those requirements and others relating to wetlands, floodplains, erosion control, buffers, and stream crossings are set forth in Rules and Standards. The Commissions first adopted standards in 1984. The standards were significantly revised in 2002 and issued jointly in 2003 as part of the Second Generation Management Plan, and then reviewed and revised again in 2008. During the Third Generation Plan development the Rules were again reviewed and revised and reissued with that Management Plan. As noted above in the Plan Amendment section, soon after Third Generation Plan was adopted the Atlas 14 hydrologic standards were adopted statewide, and the rules were revised to require those standards to be used in hydrologic and hydraulic modeling in the watershed. The Commissions also act as the Local Government Unit (LGU) for Wetland Conservation Act (WCA) administration for about half the member cities.

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.

Table 2 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 2. Project review history 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	8 *	1 *	11 *	1 *
TOTAL	97	36	66	27

*Through September 2021.

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 3rd Lane project, and the upcoming T-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), and 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

Monitoring Program

The Commissions operate a robust monitoring program that tracks conditions in the lakes and major streams of the watersheds. The lakes in the watershed are monitored on a rotating basis every two to three years. Much of the lake monitoring is completed by volunteers through the Met Council's Citizen-Assisted Monitoring Program (CAMP). Each year the Commission performs in-depth surface and water column monitoring on two lakes and updates fish and aquatic vegetation surveys. Flow and water quality is routinely monitored at two locations on Shingle Creek and one on Bass Creek, and at two Mississippi River outfalls per year on a rotating basis. Shingle Creek also collaborates with the USGS, which operates a monitoring station on Shingle Creek at Queen Avenue in Minneapolis. "Real time" data including current flow and water temperature is available [here](#). Data is summarized in an Annual Water Quality Report that is available on the Commissions' website.

Education and Outreach Program

The Third Generation Plan set forth three education and public outreach goals and several strategies for achieving them. The Commissions' Education and Public Outreach Committee mostly works with the West Metro Water Alliance (WMWA), a collaborative formed by the Commissions along with 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.

Other education and outreach activities include:

- 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.
- Outreach to local print and cable television for news coverage of commission and city projects.

Special Studies

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 bioinfiltration 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 regional BMPs such as stormwater ponds.

- Champlin Redevelopment Area (WM)
- Crystal Shopping Center Area (SC)
- Brooklyn Center Evergreen Park Neighborhood (WM)
- Pike Lake Subwatershed in Plymouth (SC)
- Pike Lake Subwatershed in Maple Grove (SC)
- Minneapolis in Shingle Creek (SC)

Directly Connected Untreated Areas. Commission staff completed a GIS analysis to delineate the areas of the watershed that contribute stormwater to the lakes and streams without any intervening treatment, whether from BMPs, wetlands, or lakes. These areas could benefit from enhanced street sweeping or targeted BMP retrofits.

HUC8 Special Hazard Areas Study. Shingle Creek received a grant from the DNR to update hydrologic and hydraulic modeling for the watershed using the most recent Atlas 14 rainfall depths and distributions. This modeling will be used by the DNR and FEMA to update the Flood Insurance Study Special Hazard Area (Floodplain) maps.

Research Projects

Paired Intersection Study. Between 2009 and 2013 Shingle Creek and City of Robbinsdale completed a research project to investigate whether porous asphalt could be used as a physical substitute for road salt as an ice prevention method. Two low-volume residential intersections in Robbinsdale were selected as test sites. One leg of each was reconstructed using porous asphalt pavement. An adjacent intersection at each served as control. During the two year monitoring period, the control intersections were plowed and salted as usual. The test sections were plowed, but no salt or sand was applied. Images taken by closed circuit cameras overlooking the sites were used to estimate bare pavement. Results suggest that unsalted porous asphalt pavement can have net bare pavement comparable to a salted traditional pavement section.

Public Art Reaeration. Shingle Creek received a research grant to design and install in-stream structures to add dissolved oxygen to streamflow to help sustain aquatic organisms. Unlike traditional “bubblers” or other aeration techniques, the Commissions proposed to challenge artists to design artistic structures. Working with Forecast Public Art, two artists were selected and designs proposed, however, the estimated cost of installation and maintenance of the structures made the project infeasible, and the project did not proceed to completion.

Modular Green Roofs. Green roofs can be expensive and difficult to retrofit when existing roofs have little additional load bearing capacity. The objective of this 2012-2015 research study was to develop and test several versions of a do-it-yourself lightweight, portable, modular system of soil media and plants that could be constructed and installed by non-professionals on existing rooftops to catch and retain precipitation that would otherwise be converted to urban runoff. The modules would be suitable for installation without the need for supplemental structural reinforcement, membrane installation to combat leakage, or intensive maintenance such as supplemental irrigation. They were installed and tested on rooftops in Brooklyn Park, Robbinsdale, and Maple Plain, and proved effective, and are still in place today.

Biochar Filters. The Commissions obtained a federal Section 319 grant to fund a project to field-trial three applications of a promising yet simple technology to help reduce bacteria such as *E. coli* in stormwater. Biochar – a specially engineered type of charcoal – added to iron-enhanced sand filters was effective in lab experiments at removing bacteria in synthetic stormwater. The three field trials tested the effectiveness of these filters at treating real-world stormwater runoff by adding the substance to stormwater pond iron-enhanced sand filter benches; to filters placed in storm sewer catch basins; and to a filter bed to treat flow diverted from Shingle Creek. Construction was completed in 2016, and the applications were effectiveness-monitored in 2016-2017.

Progress Toward TMDLs

Thirteen of the 16 lakes in the Shingle Creek watershed were initially designated as Impaired Waters for excess nutrients by the MPCA (Table 3). Several impairments were also designated on Shingle and Bass Creeks. Total Maximum Daily Load (TMDL) studies have been completed to determine the sources of those pollutants and the amount of annual pollutant load reduction required, and implementation actions identified. The Commission has systematically reviewed progress toward meeting those requirements

through TMDL Five Year Reviews. All the lakes have been completed and work is underway on the balance of the stream TMDLs. These Five-Year Reviews summarize the actions that have been taken, the amount of load reduction that has been achieved, and priorities for the coming 5-10 years.

Three of the impaired lakes have subsequently been “delisted,” or removed from the Impaired Waters list, as they now meet state water quality standards:” Schmidt, Lower Twin, and Ryan Lakes.

Table 3. Status of TMDLs in Shingle Creek.

Water Resource	Impairment	TMDL Approved	5-year Review
Bass Lake	Nutrients	9/25/09	2017
Cedar Island Lake	Nutrients	4/14/10	2018
Crystal Lake	Nutrients	3/25/09	2016
Eagle Lake	Nutrients	4/14/10	2018
Lake Magda	Nutrients	9/30/10	2019
Meadow Lake	Nutrients	3/23/10	2019
Pike Lake	Nutrients	4/14/10	2018
Pomerleau Lake	Nutrients	9/25/09	2017
Ryan Lake	Nutrients	11/9/07	2014
Schmidt Lake*	Nutrients	9/25/09	2017
Upper, Middle, and Lower Twin Lake* and Ryan Lake*	Nutrients Mercury in fish PFOS, PCB in fish	11/9/07 3/27/07 (MPCA) Not yet begun (MPCA)	2014
Shingle Creek	Chloride	2/14/07	2014, 2022
Shingle Creek	Dissolved oxygen	11/4/11	In progress
Shingle Creek	Biota-macroinvertebrates	11/4/11	In progress
Shingle Creek	<i>E. coli</i>	11/20/14 (MPCA)	2022
Bass Creek	Biota-fish	11/4/11	In progress
Bass Creek	Chloride	Metro wide TMDL (MPCA)	2022

*Schmidt, Lower Twin, and Ryan Lake were “delisted” in 2014.

Cost Share Projects

The Shingle Creek Commission operates two programs to share in the cost of small BMP installations. The City Cost Share Program provides matching funding for City voluntary BMPs. The Partnership Cost Share Program provides up to 100% of the cost of voluntary BMPs on private property. West Mississippi also operates a City Cost Share Program, and in 2021 created a Partnership Cost Share Program that will be available for voluntary projects starting in 2022. For each program the respective watershed levies and amount annually. Cost share guidelines specify project eligibility, and participation is granted on a first come first served basis as funds are available. In 2018 the Commissions received a grant of \$103,571 from the Board of Water and Soil Resources from the Watershed Based Funding Pilot Program that was used to supplement funding for these cost share projects.

Table 4 shows the City Cost Share projects undertaken in Shingle Creek. Only one project has been completed in West Mississippi – a contribution of \$35,442 to the Brooklyn Park River Park stormwater pond project.

Table 4. Shingle Creek City Cost Share projects 2013-2021.

Year	Project	Description	Cost Share
2015	Brooklyn Center City Garage	UG treatment added for runoff from impervious area	\$28,116
2015	New Hope Rain Garden	New rain garden added as part of neighborhood street project	17,200

Year	Project	Description	Cost Share
2016	Brooklyn Park Bass Creek	New pond added as part of neighborhood street project	43,623
2016	Minneapolis Blooming Blvds	Infiltration areas added to alleys in Crystal Lake drainage area	17,000
2017	Crystal Skyway Neighborhood	UG treatment added as part of neighborhood street project	50,000
2017	Robbinsdale 37 th Avenue	UG treatment added as part of neighborhood street project	50,000
2018	Crystal Becker Park	UG treatment added as part of park project	50,000
2019	Brooklyn Center Brine Equipment	Brine making and storage equipment added at Garage	50,000
2020	New Hope City Hall	UG treatment added as part of park project	49,066
2020	Crystal W. Broadway	UG treatment added as part of redevelopment project	50,000
2021	New Hope Meadow Lake	Preparation for lake drawdown	18,129
TOTAL			\$423,134

Table 5 shows the Partnership Cost Share projects to date. The City of Brooklyn Park and Metro Blooms have formed a fruitful partnership with several large multi-family residential property managers to undertake BMP and native planting retrofits on the grounds of multi-family facilities. The Shingle Creek Commission and Hennepin County have contributed funding to several of these projects. Part of the benefit of these projects is the intensive outreach and education to the facility residents, many of whom come from traditionally underserved populations. The residents participate in planting and maintenance and become stewards of the gardens. Management and maintenance staff also receive training in watershed-friendly practices.

Table 5. Shingle Creek Partnership Cost Share projects 203-2021.

Year	Project	Description	Cost Share
2018	Autumn Ridge I	Rain gardens and native plantings on apartment complex grounds	\$50,000
2019	Twin Lake North	Rain garden and floodplain native plantings on apartment complex grounds	43,510
2019	Autumn Ridge II	Rain gardens and native plantings on apartment complex grounds	50,000
2020	Brooks Landing	Rain gardens and native plantings on senior complex grounds adjacent to Shingle Creek	30,000
2020	Crescent Cove	UG treatment and native plantings, lake buffer on residential facility adjacent to Upper Twin Lake	50,000
2021	Brooks Gardens	Rain gardens and native plantings on apartment complex grounds	30,000
TOTAL			\$253,510

Grants

The cities that make up the Commissions have been actively taking actions to manage and improve the water resources in the watersheds. The Commissions have been fortunate to have been very successful at applying for and receiving grants to undertake projects and special studies. As detailed in Table 6, this has provided nearly \$3.5 million to supplement local funding

Table 6. Grant funding received 2013-2021.

PROJECT	AMOUNT	SOURCE	YEAR
Connections at Shingle Creek	\$200,000	BWSR CWLA	2014
SC Reaeration Structures	\$93,500	MPCA Section 319	2014
Twin Lake Carp Management	\$100,000	MPCA Section 319	2015
Biochar Enhanced Filters	\$199,625	MPCA Section 319	2015
Becker Park Infiltration	\$725,000	BWSR CWLA	2015
Becker Park Infiltration	\$200,000	Met Council	2017
Becker Park Infiltration	\$150,000	Met Council	2017
SRP Reduction Project	\$72,170	MPCA Section 319	2018
Flood Hazard Mapping Update	\$50,000	DNR	2018
Bass and Pomerleau Alum Treatment	\$267,040	BWSR CWLA	2017
Minneapolis SWA	\$38,000	BWSR AIG	2017
Crystal Lake Management Plan	\$216,066	MPCA Section 319	2019
Watershed Pilot Program	\$103,571	BWSR WBIF	2018
Meadow Lake Drawdown	\$40,000	BWSR WBIF	2020
Bass Creek Restoration	\$70,000	BWSR WBIF	2020
Meadow Lake Management Plan	\$153,510	BWSR CWLA	2020
Connections II Stream Restoration	\$328,000	BWSR CWLA	2020
SRP Channel Extension	\$75,000	HC Opportunity	2021
Palmer Estates Stream Restoration	\$384,000	BWSR CWLA	2021
TOTAL	\$3,465,482		

WBIF = Watershed Based Implementation Funding; CWLA = Clean Water Legacy Act; IG = Advance Implementation Grants

Capital Projects

The Commissions share in the cost of qualifying capital projects in accordance with a CIP Cost Share Policy. The Commission share is funded using the authority under Minn. Stat. 103B.251, which allows the Commissions to request Hennepin County to levy an ad valorem tax on their behalf across all the property in the watershed. Any excess levy funds after project close outs are segregated in a Closed Projects Account and may be used only for additional capital projects. The Commissions do not have the authority to contract for capital projects on their own. Cities serve as contracting agencies and are then reimbursed from Commission funds. Tables 7 and 8 show the Third Generation capital projects and levies for each watershed.

Table 7. Shingle Creek capital 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
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

Year	Project Name	Commission Share	Local Share	Grants	Total Cost	Amount Levied
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 ¹	\$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 Resto	\$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 Resto	\$600,000	\$0	\$384,000	\$600,000	\$636,300
2021	SRP Channel Phase I ²	\$50,000	\$0	\$75,000	\$125,000	\$0
2021	SRP Channel Phase II	\$125,000	\$0	\$0	\$125,000	\$132,565
	TOTAL	\$4,484,450	\$2,250,000	\$3,073,911	\$9,529,811	\$4,236,040

¹Commission share was paid for using the proceeds from the 2014 Bass Lake Improvements levy

².Commission share was paid for from the Closed Projects Account.

Table 8. West Mississippi capital projects and levies, 2013-2021.

Year	Project Name	Commission Share	Local Share	Grants	Total Cost	Amount Levied
2012	Stream Stabilization Mill Pond	\$125,000	\$375,000		\$500,000	\$125,000
2013	None	\$0	\$0		\$0	0
2014	City Cost Share	\$50,000	\$50,000		\$100,000	\$50,000
2015	City Cost Share	\$50,000	\$50,000		\$100,000	\$50,000
2016	City Cost Share	\$50,000	\$50,000		\$100,000	\$50,500
2016	Biochar Pond Retrofits	\$80,000	\$0	\$49,875	\$129,875	\$80,800
2017	City Cost Share	\$50,000	\$50,000		\$100,000	\$50,000
2017	Miss Crossings Rain Garden	\$54,800	\$164,200		\$219,000	\$54,800
2018	City Cost Share	\$50,000	\$50,000		\$100,000	\$53,025
2019	City Cost Share	\$50,000	\$50,000		\$100,000	\$53,025
2020	City Cost Share	\$50,000	\$50,000		\$100,000	\$53,025
2020	Miss Crossings Phase B Infiltration Vault	\$100,000	\$300,000		\$400,000	\$106,050
2020	River Park Stormwater Improvements	\$121,250	\$363,750		\$485,000	\$128,585
	TOTAL	\$831,050	\$1,552,950	\$49,875	\$2,433,875	\$854,810

Evaluation of Goals and Strategies

Third Generation Priorities

The Third Generation Watershed Management Plan established five priorities to be addressed in the 2013-2022 planning period. The Plan also established goals in six areas – water quantity, water quality, groundwater, wetlands, drainage systems, and operations – and priority actions. The following is an overview of progress through mid-2021.

Priority 1: Work aggressively toward achieving TMDL lake and stream goals.

The member cities, other agencies, and private property owners have implemented a variety of actions to improve lakes and streams, from the large capital projects detailed earlier in this report to individual property maintenance choices. Some examples include:

- Investing in road salt pre-wetting equipment, plow operator training, and revising plowing and ice control standards to minimize the use of road salt to the minimum required for public safety.
- Investing in regenerative air street sweepers and increasing the frequency of street sweeping.
- Routinely incorporating Best Management Practices into public infrastructure projects.
- Moving beyond watershed load reductions to addressing lake and stream internal load reduction projects such as alum treatment, rough fish management, and stream restorations.
- Enhancing public education and outreach about waters and good practices, from elementary students to lake associations to tabling at city festivals and events.

Priority 2: Revise the Rules and Standards to achieve more load and runoff volume reduction.

Concurrent with adoption of the Plan, the Commissions revised the rules to apply to smaller projects – down to 0.5 acres in size – and increased the required infiltration volume from 0.5 inches to 1 inch.

Priority 3: Expand the public education and outreach program to reach more stakeholders.

The Commissions are members of the West Metro Water Alliance (WMWA), in collaboration with Elm Creek and Bassett Creek to pool resources and ideas, and to focus on delivering common messages across the wider area. WMWA also initiated the Watershed PREP program, which provides classroom lessons to fourth grade students throughout the four watersheds.

Priority 4: Retrofit BMPs in developed areas in the most cost-effective way.

The Commissions have completed several subwatershed assessments to systematically study small areas to identify the most cost-effective practices. Funding for those practices is available through the cost share programs and the CIP.

Priority 5: Develop a whole-watershed sustainable water budget.

At the time the Third Generation Plan was completed, there was a concern about 1) the loss of wetlands in Brooklyn Park and Champlin due to changing groundwater patterns, and 2) periodic low-flow conditions in Shingle and Bass Creeks contributing to the fish and macroinvertebrate communities. As work proceeded the past several years, the conclusion was reached that this was part of a larger Metro-wide issue that was likely not solvable locally.

Progress Toward Third Generation Goals and Actions

Water Quantity

Third Generation Goals	Progress Toward Goals	Expected Completion	Status
A.1 Maintain the existing 100-year flood profile throughout the watersheds.	Ongoing.	Ongoing.	On track
A.2 Determine ecological low flows for Shingle and Bass Creeks	Not yet completed.	Will not be completed.	Needs work

Water Quantity Actions:

Third Generation Actions	Progress Toward Goals	Expected Completion	Status
a. Maintain and update as necessary a calibrated hydraulic model of Shingle Creek and its tributaries	Completed work on the HUC8* special flood hazard areas modeling and submitted to the DNR for review and comment.	Will complete in 2021-22.	On track
b. Maintain rules and standards requiring new development and redevelopment to control the rate and volume of runoff discharged from their sites and update those standards as necessary.	Keep abreast of requirements of other WMOs and agencies.	Will continue to monitor industry developments and regulations and revise rules and standards as necessary.	On track
c. Develop a sustainable water budget for each watershed and an action plan for management activities necessary for its achievement	None.	Will not be completed.	Needs work

*HUC = Hydrologic Unit Code

Water Quality

Third Generation Goals	Progress Toward Goals	Expected Completion	Status
B.1 As lake water quality improves and lakes are removed from the State's Impaired Waters list, implement management strategies to protect lake water quality. It is anticipated that Schmidt, Lower Twin, and Ryan Lakes will be removed in 2014.	Schmidt, Lower Twin, and Ryan were removed from the 303(d) list in 2014	Will continue to monitor and implement protection strategies as funding and opportunities are available.	On track
B.2 Implement phosphorus and sediment load reduction actions sufficient to achieve delisting from the Impaired Waters list for Bass, Eagle, Crystal, and Middle Twin Lakes.	Projects have been completed or are scheduled for Crystal and Bass, continuing to monitor water quality. Neither Eagle nor Middle Twin meet the standard at this time.	Bass now meets standard, and if this persists may be delisted by 2024. Projects are underway for Crystal, not clear at this time whether additional actions will be necessary to meet the state standards goal. NO projects currently scheduled for Eagle. Middle Twin likely won't meet goal until more improvement is made to Upper Twin.	On track/ Work needed
B.3 Improve water clarity in the balance of the lakes by 10% over the average of the previous ten years.	Data analysis is underway to evaluate progress. Alum treatments for Pomerleau completed in 2019 and 2020 and lake now meets state standard.	Pomerleau now meets standard, and if this persists may be delisted by 2024. Will continue to implement load-reduction projects as funding and opportunities are available.	On track
B.4 Improve at least 30% of the length of Shingle Creek to meet Corridor Study and TMDL design standards.	As of 2020, 3.09 miles, or 27% of the 11.15 miles have been restored. Projects in 2021 will complete an additional 1,750 feet to achieve 3.42 miles or 30.6%.	On track to meet this goal by 2022.	On track
B.5 Maintain nondegradation of all waterbodies compared to 1985 conditions.	Review of water quality data at the Shingle Creek outlet site shows TSS concentrations have decreased 25% since 2000 and TP by 35%. Need more data to evaluate lake progress.	Will continue to implement load-reduction projects as funding and opportunities are available.	On track

Water Quality Actions:

Third Generation Actions	Progress Toward Goals	Expected Completion	Status
a. Maintain and update as necessary calibrated P8 models for each lakeshed in Shingle Creek and the major drainage areas of West Mississippi.	P8 models for each lakeshed, calibrated to XPSWMM. Models updated as necessary for TMDL reviews.	Will make updates to lakeshed models as necessary as next round of the TMDL 5 Year Reviews.	On track Work needed
b. Maintain rules and standards requiring new development and redevelopment to control the total phosphorus and total suspended solids discharged from their sites, and update those standards as necessary.	New requirements incorporated into Third Gen Plan and enforced for ongoing development.	Will continue to monitor regulatory needs and trends and consider rules and standards revisions as necessary.	On track
c. Conduct an intensive BMP assessment for at least 25% of that part of the watershed that developed prior to Commission rules in 1984, and achieve 25% of the recommended load reduction within 10 years of the analysis.	<p><i>Shingle:</i> Completed assessments on 1,341 acres of 23,497 acres developed prior to 1984, or 5.7%. With Mpls area will be 3,387 acres or 14%</p> <p><i>West Miss:</i> Completed assessments on 1,495 acres of 7,023 acres developed prior to 1984, or 21%.</p>	<p><i>Shingle:</i> Goal of evaluating 5,874 acres by 2022 difficult; most interest is in doing compact 100-200 acre areas. More achievable goal is 15%, or 3,525 acres.</p> <p><i>West Miss:</i> It is likely that the 25% goal will be exceeded by 2022.</p>	<p><i>Shingle:</i> On track</p> <p><i>West Miss:</i> On track</p>
d. Contribute 25% of the cost of TMDL capital implementation projects (up to \$250,000).	<p><i>Shingle:</i> Contributed \$3,169,450 to 25 projects since 2013.</p> <p><i>West Miss:</i> Contributed \$831,050 to 11 projects since 2013.</p>	Will continue to contribute to projects submitted to the Commissions' CIP.	On track
e. Pursue grant and other funding to implement improvement projects and feasibility studies.	Since 2013 received 18 grants totaling \$3.08 million.	Will continue to seek grant funding for projects and special studies.	On track
f. Prepare and implement an Annual Monitoring Plan and conduct monitoring necessary to evaluate water quality conditions and trends in the lakes and streams in the two watersheds.	Completed annually.	Will continue to complete annually.	On track
g. Evaluate progress toward achieving TMDL goals every five years following adoption of the respective Implementation Plans.	Have completed review of Chloride, all the lakes.	Shingle Creek DO and Biotic Review will be completed in 2021. All 5 Year Reviews of all TMDLs are expected to be completed by 2022.	On track Work needed

Groundwater

Third Generation Goals	Progress Toward Goals	Expected Completion	Status
C.1 Infiltrate stormwater runoff from new impervious surface.	New requirements incorporated into Third Gen Plan and enforced for ongoing development.	Will continue to enforce and to urge voluntary compliance where infiltration is not required.	On track
C.2 Identify opportunities for and implement projects to infiltrate runoff from existing impervious surface.	Have completed five subwatershed assessments that have identified infiltration BMPs. Worked with Crystal on Becker Park Infiltration Project.	Will continue to implement volume reduction projects as funding and opportunities are available.	On track
C.3 Work with the appropriate state agencies to incorporate groundwater assessment into the sustainable water budget analysis for each watershed	Not yet completed.	Will not be completed.	Work needed

Groundwater Actions:

Third Generation Actions	Progress Toward Goals	Expected Completion	Status
a. Maintain rules and standards requiring new development and redevelopment to abstract or infiltrate stormwater runoff from new impervious surface and update those standards as necessary.	New requirements incorporated into Third Gen Plan and enforced for ongoing development.	Will continue to monitor regulatory needs and trends and consider rules and standards revisions as necessary.	On track
b. Conduct an intensive BMP assessment for at least 25% of that part of the watershed that developed prior to Commission rules in 1984 and achieve 25% of the recommended volume reduction within 10 years of the analysis.	<p><i>Shingle:</i> Completed assessments on 3,387 acres of 23,497 acres developed prior to 1984, or 14%.</p> <p><i>West Miss:</i> Completed assessments on 1,495 acres of 7,023 acres developed prior to 1984, or 21%.</p>	<p><i>Shingle:</i> Goal of evaluating 5,874 acres by 2022 difficult; most interest is in doing compact 100-200 acre areas. More achievable goal is 15%, or 3,525 acres.</p> <p><i>West Miss:</i> No pending SWAs, will likely fall just short of the 25% goal.</p>	<p><i>Shingle:</i> On track</p> <p><i>West Miss:</i> On track</p>
c. Coordinate with the Minnesota DNR and other agencies to develop an action plan addressing surficial groundwater elevation issues in northern Brooklyn Park and the associated impacts on wetlands and Lake Success	Preliminary conversations.	Will be completed in the 2020-2022 time period.	Work needed

Wetlands

Third Generation Goals	Progress Toward Goals	Expected Completion	Status
D.1 Maintain the existing functions and values of wetlands identified in the Commissions' Water Quality Plan as high priority.	For WCA projects where the Commissions are the LGU, are noting where the wetland is a priority wetland. Have not yet set up a process for evaluating this.	Not clear.	Work needed
D.2 Informed by the sustainable water budget study, improve functions and values of wetlands.	Not yet completed.	Will be completed in the 2020-2022 time period.	Work needed

Wetland Actions:

Third Generation Actions	Progress Toward Goals	Expected Completion	Status
a. Adopt a wetland replacement sequencing policy.	Rules and Standards include a sequencing preference.	Will continue to monitor regulatory needs and trends and consider rules and standards revisions as necessary.	On track
b. Identify wetland restoration opportunities and implement projects to restore wetland functions and values or to create new wetland acreage.	Minor vegetation enhancement on Wetland 639W project.	Will continue to pursue grant funds and implement projects as funding is available.	On track

Drainage Systems

Third Generation Goals	Progress Toward Goals	Expected Completion	Status
E.1 Continue current Hennepin County jurisdiction over County Ditch #13	Continue current jurisdiction.	Will continue current jurisdiction unless otherwise agreed to.	On track

Drainage System Actions:

Third Generation Actions	Progress Toward Goals	Expected Completion	Status
a. Periodically reconsider the appropriate jurisdiction over County Ditch #13.	Considered during development of the Third Gen Plan, no change.	Will reconsider as requested.	On track

Commission Operations and Programming

Third Generation Goals	Progress Toward Goals	Expected Completion	Status
F.1 Identify and operate within a sustainable funding level that is affordable to member cities.	Commissions continue to operate within the Assessment Cap specified in the JPA.	Ongoing.	On track
F.2 Foster implementation of TMDL and other implementation projects by sharing in their cost and proactively seeking grant funds.	Contributed to 17 Shingle projects and to 6 West Miss projects since 2013. Established City BMP and Partnership Cost Share programs and contributed to 16 BMP retrofits in SC and 1 in WM. Received over \$3 million in grants.	Will continue to cost-share through the county levy and to pursue grant funds and implement projects as funding is available.	On track
F.3 Operate a public education and outreach program that meets the NPDES Phase II education requirements for the member cities.	Shingle Creek and West Mississippi partner with Bassett Creek and Elm Creek and other agencies and nonprofits to provide education and outreach through the West Metro Water Alliance (WMWA). An annual report is provided to the member cities for the NPDES annual report.	Ongoing, in partnership with WMWA and other organizations. WMWA is updating educational materials to meet the new NPDES requirements.	On track
F.4 Operate a monitoring program sufficient to characterize water quantity, water quality, and biotic integrity in the watersheds and to evaluate progress toward meeting TMDL goals.	The commissions operate ongoing lake, stream, and wetland monitoring programs using both commission technical staff and volunteers.	Ongoing annually.	On track
F.5 Maintain rules and standards for development and redevelopment that are consistent with local and regional TMDLs, federal guidelines, source water and well head protection requirements, sustainable water yields, nondegradation, and ecosystem management goals.	Requirements consistent with the NPDES General Stormwater Permit and MIDS were incorporated into Third Gen Plan and enforced for ongoing development. The MN NPDES General Permit was reissued and is under review to assess potential for rules modification.	Will complete review as necessary.	On track
F.6 Serve as a technical resource for member cities.	The Commissions maintain an ongoing Technical Advisory Committee.	Ongoing.	On track

Commission Operations and Programming Actions:

Third Generation Actions	Progress Toward Goals	Expected Completion	Status
a. Annually review the budget and Capital Improvement Program.	Established a process and schedule for annual review and modification of the CIP.	Ongoing annually.	On track
b. Maintain an Education and Public Outreach Committee (EPOC) that is charged with developing and implementing an annual education and outreach plan.	Most of the EPOC business is done in conjunction with WMWA. Continually updated website and registered nearly 7,300 unique page views January-November. Posted to social media and achieved 205 Facebook followers	Ongoing.	On track
c. Prepare and implement an annual monitoring plan and summarize the results in an annual water quality report.	Completed annually.	Ongoing annually.	On track
d. According to the schedules set forth in TMDL Implementation Plans, every five years evaluate progress toward meeting TMDL water quality goals, and adjust the Implementation Plans as necessary to achieve progress.	Have completed review of Shingle Creek Chloride and all lake TMDLs. Shingle Creek DO and Biotic Review underway.	All 5 Year Reviews of all TMDLs are expected to be completed by 2022.	On track Work needed
e. Every five years or as necessary review the development rules and standards for adequacy and make revisions as necessary.	Minor amendment to incorporate Atlas 14. The recently reissued MN NPDES General Permit is under review to assess potential for rules modification.	Will complete review as part of the 4 th Gen Plan process and adopt revisions as necessary.	On track
f. Continue research projects on innovative and cost-effective stormwater management practices and technologies.	Received Section 319 grant funding for and completed the Modular Green roof study, the Paired Intersection Study, Biochar- and Iron-Enhanced Sand Filters Project., and the SRP Reduction Project.	Will continue to seek grant resources and partnerships to conduct BMP research.	On track
g. Coordinate water resources management between the Commissions and the member cities.	Maintained an ongoing Technical Advisory Committee.	Ongoing.	On track