WATERSHED MANAGEMENT PLAN

SOUTH WASHINGTON WATERSHED DISTRICT

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2017

2017

This watershed management plan establishes the goals and programs which form the foundation for managing water resources within the South Washington Watershed District.

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EXECUTIVE SUMMARY

PURPOSE AND HISTORY

What is now the South Washington Watershed District (SWWD) was formed in 1993 as the 42nd Watershed District in the State. At the time, the District's focus was primarily on working with communities to address intercommunity flow between the District's northern watershed including portions of Afton, Lake Elmo, Oakdale, and Woodbury that drain into Cottage Grove. Since that time, the District's focus has expanded to include a wide range of flooding, water quality, natural resource, and groundwater issues as well as emerging issues such as climate change. Additionally, the District has grown geographically expanding to include the former East Mississippi Watershed Management Organization and a portion of the former Lower St. Croix Watershed Management Area. The District now covers 110 square miles at the confluence of the Mississippi and St. Croix Rivers, which includes 12 lakes, over 120 miles of piped and natural streams, and over 2,400 acres of wetlands. A map of the District can be found on page 9 or on the District's web viewer at http://map.swwdmn.org/. Additional history and plan context is provided in Part I of the plan.

ISSUES AND GOALS

Drawing on evaluations of past District performance and input of District residents and partners, several issues were identified during development of this plan. While issues are wide ranging, they can be categorized into several primary areas—Flooding, Watershed Alterations, Groundwater Sustainability, Natural Resources, Climate Change, Information and Education, and Efficiency and Accountability.

Reflecting identified issues, the goals of this plan are also wide ranging. However, each goal can in some way be tied to minimizing effects of flooding, protecting or restoring District land, surface water, and groundwater resources, adapting for climate change, educating District stakeholders, and effectively and efficiently operating the organization. Each of the identified issues and associated goals are detailed in Part II of the plan.

ACTION

To address identified issues and goals, the District operates in four primary program areas—Planning, Regulatory, Implementation and Maintenance, and Education and Information—in addition to providing for effective and efficient administration of the organization. As part of annual evaluation and reporting processes, the District reviews and adjusts existing programs to ensure it can continue to effectively address identified issues. Each program areas is covered in Part III of the plan which also includes the District's long range workplan that project District expenditures over the life of the plan.

Reflecting the District's mission—To manage water and related resources of the District in cooperation with our citizens and communities—the District expects Cities and Townships to be active partners in addressing issues identified in this plan. Most notably, the District requires communities to adopt local water management plans that are in conformance with this plan, Minnesota State Rules and Statutes, and Metropolitan Council Water Resources Policy Plan. Additionally, that plan must include a mechanism for implementation progress. Within 6 months approval of a local plan, communities must also enact local controls which reflect SWWD Rules. Additional information about the District's expectations of communities is in Part III of this plan.

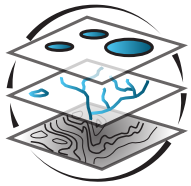
HOW TO USE THIS PLAN

This Watershed Management Plan is structured to provide implementation flexibility and utilize several web-based, interactive tools. Because of this structure, we strongly recommend that the plan be viewed on the web at http://www.swwdmn.org/about-swwd/watershed-plan/. The text of the plan itself is kept intentionally brief so as to provide an accessible, general overview of the District, issues it faces, and its implementation programs. However, the plan is also intended to serve as a navigation tool for citizens, consultants, and municipal and agency staff to quickly and effectively locate existing information related to a specific topic of interest. To facilitate that purpose, we have taken several steps.

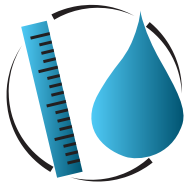
- As you read through the plan you will notice several live links. These links will point to related sections of the plan. For instance, for each issue identified in Part II of the plan, there is a section titled Implementation Strategy and Tools which will include live links to relevant implementation programs in Part III.

- Each Issue and Program section includes a subsection titled Additional Information which points you to all relevant resources that we are aware of. This includes not only SWWD resources (e.g. Guidance Documents) but also those of our local, regional, state, federal, and non-governmental partners.

- In appropriate sections, you will notice several interactive buttons which direct them to interactive web resources on the SWWD website, including:



Web Viewer: This resource houses basic District geographical data and provides several basic mapping and ID functions.



Water Quality Monitoring Database: This resource holds all of the District's surface water quality monitoring data and provides basic graphical and statistical functions. It also serves a portal to download District water quality data.

Story Maps: These resources provide additional information about District projects including photos and interactive maps.

Electronic Library: This resource houses all District resources, including meeting agendas and minutes, guidance documents, lake management plans, monitoring reports, annual reports, etc.

BOARD OF MANAGERS

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PART I : SWWD INTRODUCTION

This section provides only a summary of District history, land and water resources inventory, and trends. Additional information including all references, past plans, and guidance documents is available in the SWWD library at www.swwdmn.org.

The Minnesota Watershed Act, MSA103D, authorizing Watershed Districts was passed in 1955. Established as local, special-purpose units of government, Watershed District boundaries follow those of a natural watershed. Typically established for flood control or drainage improvement, Watershed Districts are now increasingly focused on water quality issues, particularly in the Minneapolis, St. Paul metropolitan area. The South Washington Watershed District (SWWD) is no different. First established in 1993 for the primary purpose of addressing inter-community flows and flooding concerns, SWWD's focus has grown to include protection and restoration of water resources.

The Cottage Grove Ravine Watershed Management Organization (WMO) was formed in 1984 to help address inter-community flooding concerns. The WMO was based on a joint powers agreement among the five cities in the watershed. A draft watershed management plan for the WMO was completed in April 1988. However, this plan was never approved or adopted by the WMO. The WMO was later disbanded, and, in 1993, the Cottage Grove Ravine Watershed District was formed as the 42nd watershed district in Minnesota. The watershed district changed its name to SWWD in 1995. The first SWWD Watershed Management Plan (WMP) was completed and adopted in September, 1997 and later amended in 2002. This first WMP was heavily oriented toward inventory and

Additional information including all references, past plans, and guidance documents is available in the SWWD library at www.swwdmn.org

assessment of District resources.

In April 2003, the SWWD petitioned the Minnesota Board of Water and Soil Resources (BWSR) to enlarge the boundary and include the former East Mississippi Watershed Management Organization (EMWMO) as recommended in the Washington County Water Governance Study (1999). The EMWMO included all or portions of Grey Cloud Island Township, Cottage Grove, Woodbury, St. Paul Park and Newport. The enlargement petition was approved on May 2003 by the BWSR.

In 2007, SWWD's second WMP was adopted and later amended in 2009 and 2011. Building on work completed under the first WMP, the second WMP emphasized implementation to address inter-community flow concerns and begin to manage District land and water resources to protect and restore their value to District residents.

In May 2010, the SWWD again enlarged its boundary to include 3 additional catchments from the former Lower St. Croix Watershed Management Organization (LSCWMO). The enlargement petition was approved in September 2010 by BWSR, making SWWD one of the few Watershed Districts to manage area within two major watershed basins.

This Watershed Management Plan once again builds on past work in the District and is intended to serve SWWD for decades to come. It is structured in three parts.

- Part I provides basic history of the District and its resources. We strongly encourage the reader to visit the SWWD website which includes the District's water quality database and web map viewer. Additionally, the website includes the District's electronic library which serves as a repository for District plans and reports described throughout this document.

- Part II includes identified issues and goals and serves as the basis for all actions that the District takes. Progress toward achieving goals will be routinely assessed and implementation actions adjusted as necessary. Should additional issues be identified by SWWD they will be incorporated through amendment.

- Part III serves as the District's implementation plan, establishing District programs and documenting the District's Long Range Workplan and Administrative procedures. This part will be routinely updated through amendment to continue to serve the District.

SWWD covers over 70,000 acres or 110 square miles at the confluence of the Mississippi and St. Croix Rivers (Figure 1). The District includes portions of two major watersheds (Mississippi and St. Croix) encompassing

SWWD HISTORY AND PLAN CONTEXT

12 lakes, over 120 miles of piped and natural streams, and over 2,400 total acres of wetlands. SWWD manages thsoe resources in partnership with its Cities and Townships (Figs 1 & 2).

Landforms and water resources in SWWD largely reflect past glacial activity. Glacial processes and runoff from melting glaciers filled pre-glacial bedrock valleys, carved new bedrock valleys, and deposited till and outwash in varying forms across the District. Today, we can see several prominent remnants of that activity.

The Mississippi River which today marks the District's western and southern boundary follows its pre-glacial valley carved into Cambrian and Ordivician bedrock. The valley bordering SWWD predates glaciation. However, repeated glaciations and melting shaped the valley that we see today. It was repeatedly scoured during times of melting, most prominently by Glacial River Warren, and filled during times of lower flow. The filled valley now forms the Mississippi River Terrace upon which the modern Mississippi River flows.[1,2] Today the filling

SWWD covers over 110 square miles at the confluence of the Mississippi and St. Croix Rivers.

process is accelerated by human activity including excessive sediment originating from the Minnesota River Valley, an extensive lock and dam system, and ongoing channel dredging to facilitate commerce. It is important to recognize, however, that the river does illustrate the success of the Federal Clean Water Act having recovered from a past marked by discharge of untreated sewage and industrial waste.[1] The river now serves as a multi-billion dollar commerce transit-way, critical flyway, and recreation attraction.

Lake St. Croix, forming the lower portion of the St.

[1]River of History, a historic resources study of the Mississippi National River and Recreation Area
[2]Geologic History of Minnesota Rivers

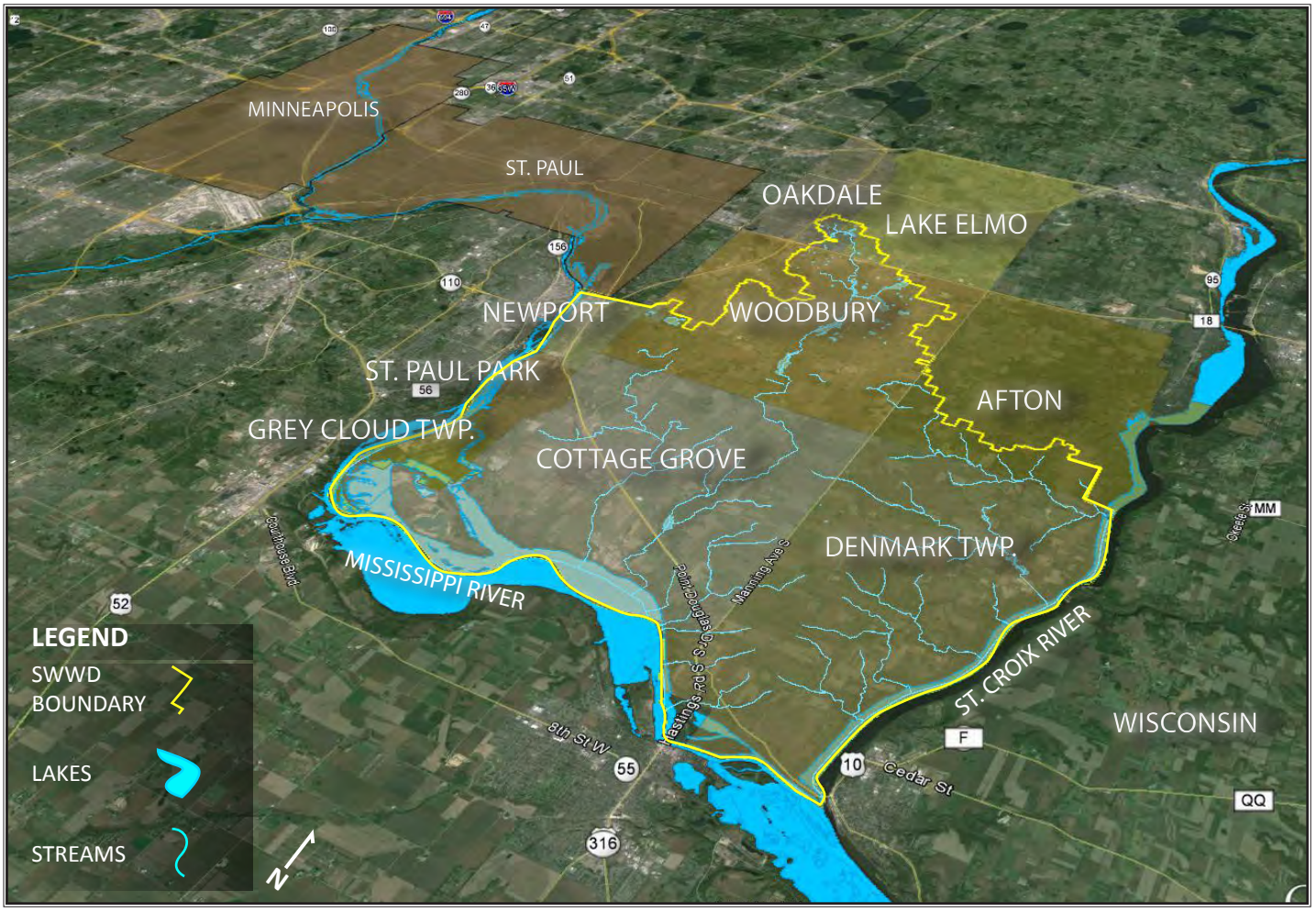


Figure 1: SWWD area with context

The District includes portions of two major watersheds -Mississippi and St. Croix- encompassing 12 lakes, over 120 miles of piped and natural streams, and over 2,400 total acres of wetlands.

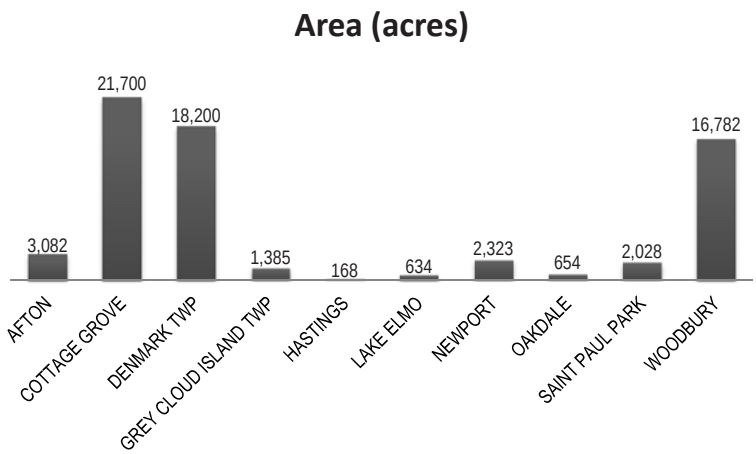


Figure 2: Area of municipalities within SWWD

Croix River marks the District's Eastern boundary. It is formed by a natural impoundment at Pt. Douglass and the confluence with the Mississippi River which causes the river to slow, widening and deepening upstream. The river was formed by outflow of Glacial Lake Duluth which carved the valley through the Cambrian bedrock and into the underlying basalt. Today, much of the valley carved by glacial outflow has partially filled, forming the St. Croix River Terrace, upon which the modern day Lake St. Croix lies.[2]

Like the Mississippi River, the St. Croix played a prominent role in the settlement and transformation of the region. Long used as a conduit to transport logs from the Northwoods of Minnesota and Wisconsin to mills in and around Stillwater, there are ongoing efforts to address pollution and sedimentation caused by industry's occupancy of the river and the substantial land use changes in the basin. [1] Despite those challenges though, the river exhibits high water quality and provides extensive habitat for native communities. The river is now a tourism and recreation attraction. That value is reflected with inclusion in the original National Wild and Scenic Rivers Act of 1968 and Lower St. Croix National Scenic Riverway Act of 1972. The St Croix is further protected in Minnesota as a designated Outstanding Resource Value Water. Today, the St. Croix Valley is dotted with state parks both in Minnesota and Wisconsin.

Several of SWWD's lakes are also remnants of past glacial activity and found exclusively in the Lake Elmo-Cottage Grove Outwash Plain. The District's most prominent lakes—the Woodbury chain, Ravine Lake—overlie a bedrock valley through the central portion of the District. As the more recent glaciers retreated, that bedrock valley was filled in with sand and rock. It is likely that the District's lakes were formed by glacial fragments (ice blocks) which were left buried in the filled bedrock valleys and melted to form the existing lake basins. Today, these lakes are an important recreational asset to residents of the District and are extensively used for active and passive recreation. Many of those lakes are currently listed as impaired, a reflection of past development and focus of District management efforts.

After decades of declining water quality, SWWD lakes are stabilizing and in some cases improving. Excess nutrients in stormwater overwhelmingly drive water quality degradation in SWWD. The source of those nutrients in SWWD is primarily erosion. Concentrations of nutrients peaked in the early 2000s and have since been slowly declining. That decline is a possible reflection of implementation efforts of the District and its local partners, increased enforcement of water quality development rules, and slowing rates of development. SWWD lakes are beginning to reflect the improvement in stormwater quality. Most notably, Armstrong and Ravine Lakes have shown substantial improvement over the past few years. Colby Lake which has been the focus of extensive watershed restoration work should also begin to show rapid improvement. Up to date lake and stormwater data is always available through SWWD's online database which also provides basic graphical functions. Additional information is included in the Water Resources of the District profile figures, pg 14-19.

SWWD's streams are concentrated on the bluffs along the Mississippi and St. Croix Rivers which was left largely untouched by the latest glaciation. What now makes up Trout Brook, O'Conner's Creek and several smaller unnamed streams are the result of centuries of stream action carving valleys through the bluff. Those large, broad valleys are now home to unique and important habitat, especially where those valley floors now intersect groundwater which provides cold water. The watersheds draining to the streams are generally rural with a strong agricultural influence. As a result, the biggest issue causing concern for the streams is runoff and field erosion early in the season before crops are established. Exacerbating that dynamic has been the recent trend of more intense early season rainfall which has driven a decline in water quality in Trout Brook over the past 5 years despite ongoing watershed and riparian restoration work.

Soils in SWWD are all derived from glacial alluvium or till deposited along the Mississippi and St. Croix valleys. Soil types that dominate the Mississippi River drainage area of the District are of the Antigo-Chetek-Mahtomedi and Sparta-Dickman-Hubbard map unit, and are formed predominantly in outwash under deciduous hardwood forest or prairie. The Antigo-Chetek-Mahtomedi soils are well drained to excessively drained, medium textured to coarse textured soils, typical on low convex side slopes or knolls, crests and side slopes. The Sparta-Dickman-Hubbard soils are somewhat excessively drained and are coarser textured soils than the Antigo type. These soils occupy

Excess nutrients in stormwater overwhelmingly drive water quality degradation in SWWD.

[3]Washington County Soil Survey
4 Washington County Historical Society

broad flats and knolls. The Copaston-Sparta map unit is well drained and excessively drained medium textured to coarse textured and dominate the soil types along the Mississippi River primarily on the historic river terrace.[3]

In the eastern portion of the watershed that drains to the St. Croix River common soil types include the Ostrander-Baytown-Ripon map unit and the Waukegan-Baytown-Ripon map unit. Both map units are formed in a silty mantle over bedrock or over glacial till or outwash. Soils are well drained and medium textured in upland areas of the watershed.[3] Soils map layers are available on the SWWD web viewer at map.swwdmn.org.

Wetlands, once common in portions of the District with dense soils have succumbed to development. However, what remains provides an important ecological, aesthetic, recreational, and economic resource. SWWD recognizes that value and actively works to protect what remains of this valuable resource through development standards and its role in administering the State's Wetland Conservation Act (WCA).

Large-scale settlement and thus land use and cover changes began with the treaties of 1837 which purchased the territory between the St. Croix and Mississippi Rivers from the Dakota and Ojibwe. Grey Cloud island with a history of native settlement quickly became a center for trade along the Mississippi River. At the confluence of the Mississippi and St. Croix, Pt. Douglas (today part of Denmark Township) served and supported logging activity in the St. Croix basin and was the start of Military Road which crosses the District in route to Fort Snelling. Throughout the District, trees were cleared and land was utilized for row crops. [1,4] Figure 3 includes additional historical influences.

The shift from the River Transportation era to Railroad Transportation Era saw a shift from Grey Cloud and Pt. Douglas to rail cities such as Newport and St. Paul Park. Continued population growth and the eventual shift to the Automobile Transportation Era brought development to farming communities like Woodbury, Cottage Grove, and Oakdale and former resort areas like Lake Elmo. Today, SWWD includes industrial river towns along the Mississippi River bluff, picturesque Townships and farmland, and one of the fastest growing communities in the State, all of which face unique resource and management challenges. [1,4] See figure 4 for land use changes from 1984 - 2010.

While the District works to address water resource impacts related to past development, it also maintains a strong focus on preventing issues from ongoing development and land use changes. SWWD recognizes municipalities as the land use authority in the District. However, it also views its role of planning and resource protection as

FIGURE 3: LAND, WATER AND ORGANIZATONAL TIMELINE SHAPING SWWD

- **10,000 BCE** ST. CROIX MORAINE - TRENDING SW TO NE PARTS OF THE COUNTY HUMMOCKY TERRAIN (SILT AND CLAY SOILS) FORMED FROM THE SUPERIOR AND DEMOINES GLACIAL LOBES; GLACIAL OUTWASH FORMING VALLEYS AND RAVINES (SAND AND GRAVEL SOILS) OF THE SOUTH-EASTERN PORTION OF THE COUNTY.
- **1838** FIRST EUROPEAN SETTLERS TO DENMARK TWP.
- **1839** MN TERRITORY CREATED/ WASHINGTON COUNTY ESTABLISHED
- **1850** MILITARY ROAD AUTHORIZED
- **1869** ST. CROIX LOGGING ERA BEGINS
- **1974** 'CITYHOOD' FOR WOODBURY AND COTTAGE GROVE
- **1984** COTTAGE GROVE WMO CREATED (CGWMO)
- **1985** LOWER ST. CROIX WMO (LSCWMO) CREATED
- **1993** (CGWMO) REORGANIZED AS COTTAGE GROVE RAVINE WD (CGRWD)
- **1995** CGRWD RENAMED AS SWWD
- **2003** SWWD EXPANDED TO INCLUDE EAST MISSISSIPPI WMO
- **2010** SWWD EXPANDED TO INCLUDE LSCWMO

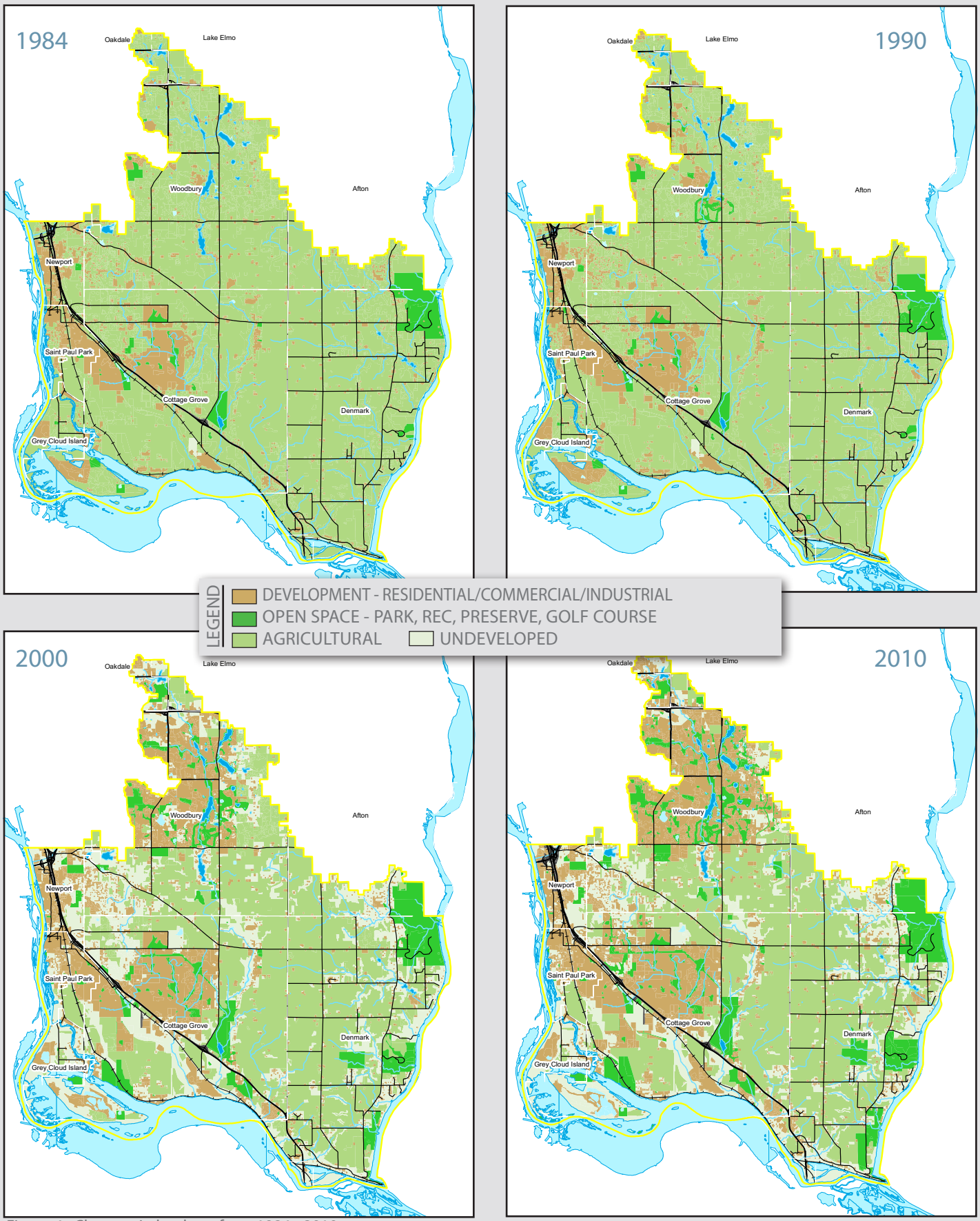


Figure 4: Changes in land use from 1984 - 2010

integral to municipal planning and development processes. SWWD fills a local planning void by taking a regional and resource based focus. Its systematic and iterative process of assessment, planning, and implementation ensures that planned growth is accommodated and that resources are protected and restored.

All residents in the District, and Washington County, rely on groundwater for drinking water. The quantity and quality of that groundwater, like that of District surface waters, is shaped by the regions geologic characteristics.[6]

Advancing and retreating marine seas left behind a sequence of limestone, sandstone, and shale bedrock layers dating back to the Paleozoic Era (570 to 245 million years ago). Following these events, the bedrock was subjected to a long period of erosion. Following that period of erosion, a series of glaciers advanced and retreated across the county shaping the bedrock and leaving in their wake formations of clay, silt, sand, and gravel on top of bedrock formations. [6] Resulting layers of bedrock, sands and gravels, and silt form the various aquifers lying beneath the District and are responsible for its characteristically high infiltration rates and recharge potential.[4] The bedrock configurations that make groundwater abundant also make it highly sensitive to pollution through high infiltration rates and presence of karst features, and industrial pollution. Further, quantities of groundwater are a growing concern. Increasing populations are increasing pumping from aquifers while simultaneously reducing chances for recharge. Still somewhat unknown, is how threats to groundwater translate to surface water resources which to date have been the focus of District management efforts.

-SWWD mission statement -

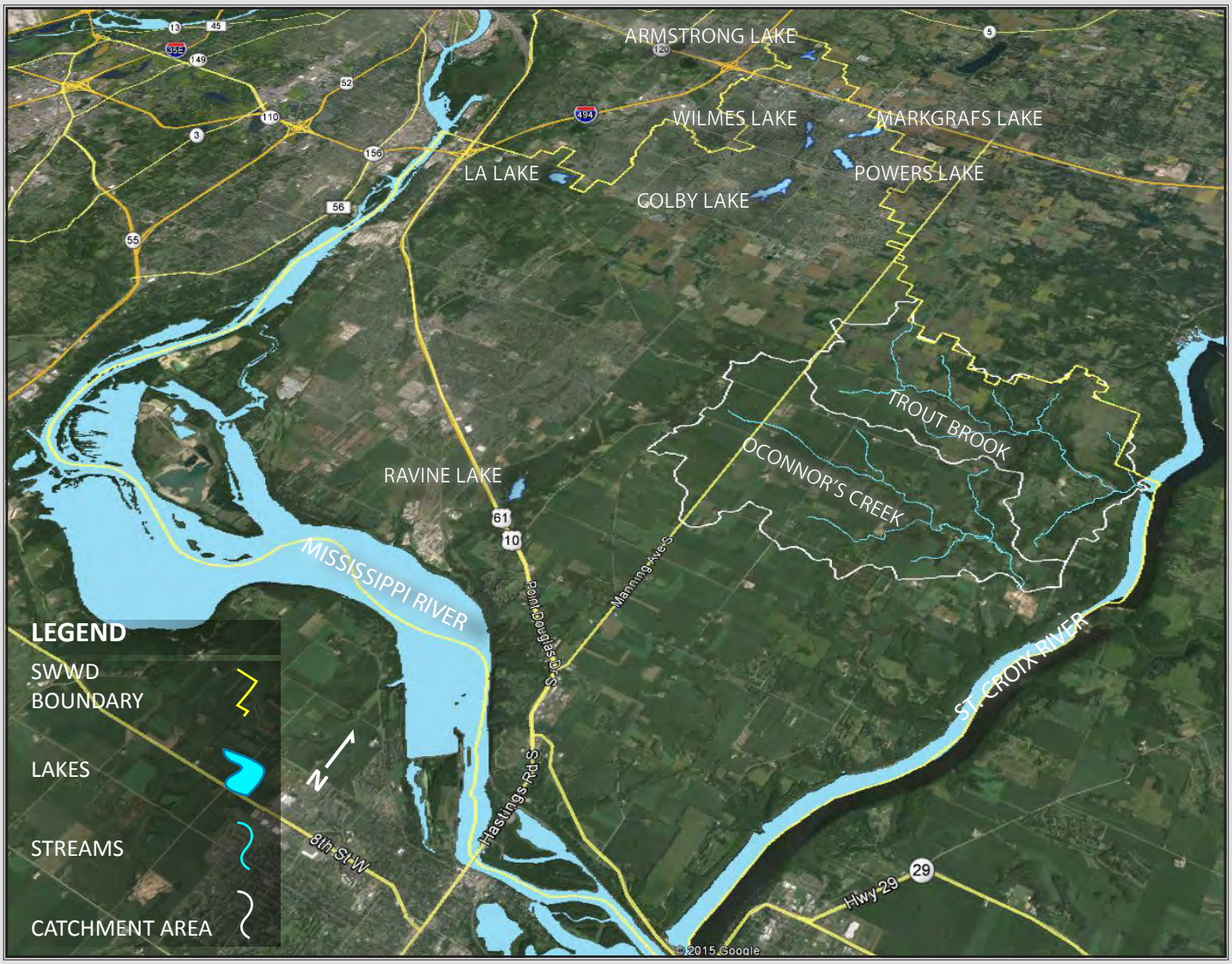
"To manage water and related resources of the District in cooperation with our citizens and communities"

In addition to challenges posed by development, the District also faces several confounding impacts from a changing climate. Data clearly shows that Minnesota's climate is changing; annual temperature and precipitation is increasing, precipitation is getting more intense, snow and ice is melting sooner, and the growing season is increasing[7]. All of these changes have serious consequences for the District. First and foremost, plans and infrastructure in the District were developed and designed based on several assumptions. While the District and its communities have always been conservative in their assumptions (i.e. planning for large events), many of those assumptions are no longer valid. Translated, that means stormwater infrastructure is undersized, buildings are too close to lakes and streams, and algae have more time to proliferate in lakes, making them unusable.

To address challenges it faces, SWWD focuses on cooperative implementation in partnership with other local, regional, and State agencies. That approach is reflected in the District's mission statement.

[4]SWWD Draft Wetland Management Plan
[6]Washington County Groundwater Plan
[7]MnDNR, State Climate Office, etc.

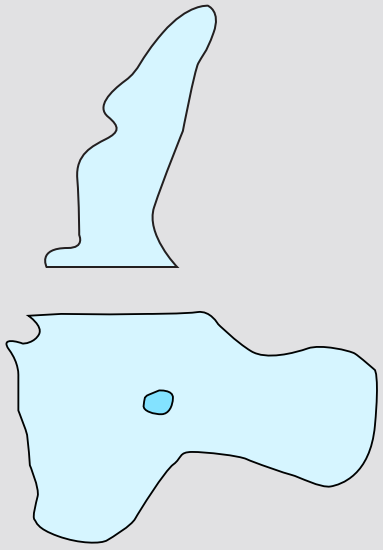
PRIMARY WATER RESOURCES OF THE DISTRICT



This map shows the primary water resources of the District. Detailed information of each water resources is provided on the following pages.

This section provides general information about each of the District's resources. For each resource, this section provides basic bathymetry information, impairment status, relevant water quality goals, and current water quality status. Information includes both state and SWWD goals. SWWD goals were established in the 2007 Watershed Management Plan and are provided here to give an indication of progress since 2007. The State goal is what is being pursued through SWWD programs. Additional information is available on Page 26.

PRIMARY WATER RESOURCES OF THE DISTRICT



5 ft gradient intervals 750 ft N

ARMSTRONG LAKE

ID: 82-0116
Waterbody Area: 39 acres
Watershed Area: 566 acres
Mean Depth: 3 feet
Max Depth: 5 feet

Water Quality:

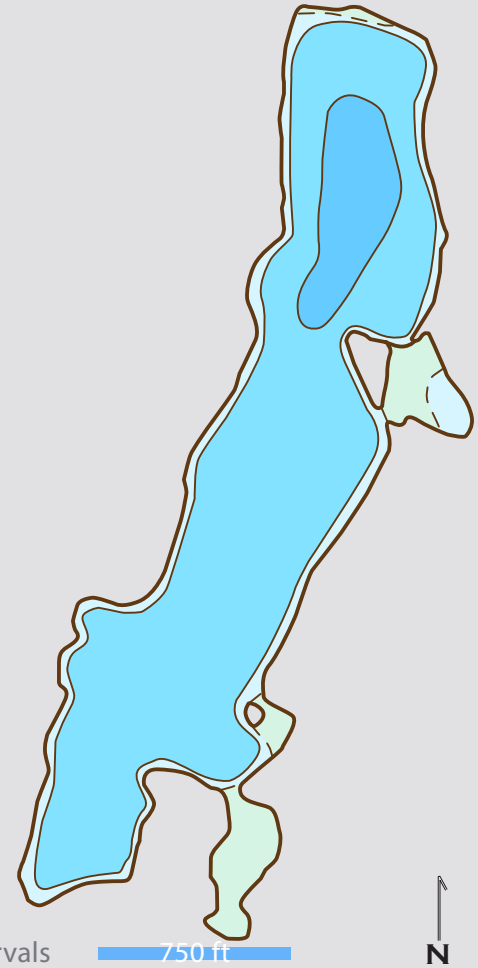
3-year Average TP Concentration: 56 ppb

Goal TP Concentration:

60 ppb (State of MN), 66 ppb (SWWD)

Period of Record Trend:

IMPROVING



5 ft gradient intervals 750 ft N

COLBY LAKE

ID: 82-0094
Waterbody Area: 68 acres
Watershed Area: 2,839 acres
Mean Depth: 7 feet
Max Depth: 11 feet

Water Quality:

3-year Average TP Concentration: 130 ppb

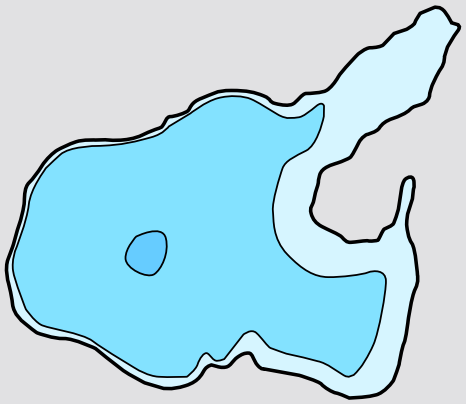
Goal TP Concentration:

60 ppb (State of MN), 107 ppb (SWWD)

Period of Record Trend:

IMPROVING

PRIMARY WATER RESOURCES OF THE DISTRICT



5 ft gradient intervals — 750 ft — N

LA LAKE

ID: 82-0097

Waterbody Area: 45 acres

Watershed Area: 81 acres

Mean Depth: 6 feet

Max Depth: 10 feet

Water Quality:

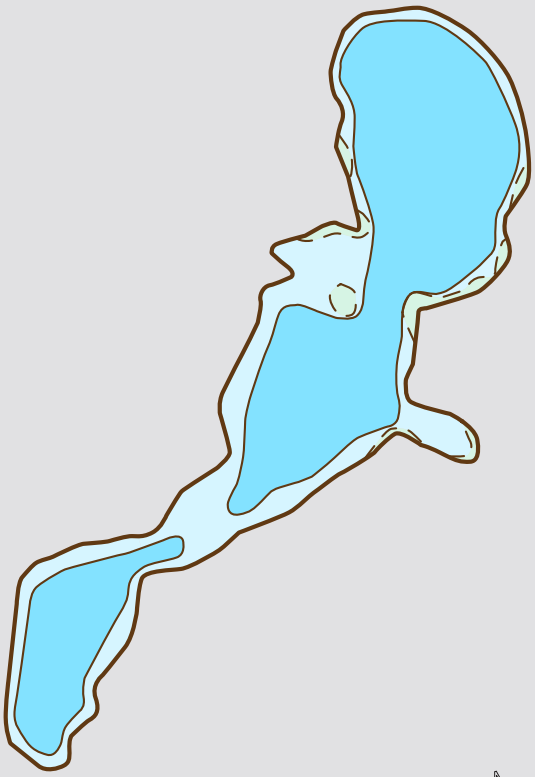
3-year Average TP Concentration: 83ppb

Goal TP Concentration:

60 ppb (State of MN),
60 ppb (SWWD)

Period of Record Trend:

DECLINING



5 ft gradient intervals — 750 ft — N

MARKGRAFS LAKE

ID: 82-0089

Waterbody Area: 46 acres

Watershed Area: 436 acres

Mean Depth: 5 feet

Max Depth: 8 feet

Water Quality:

3-year Average TP Concentration: 111 ppb

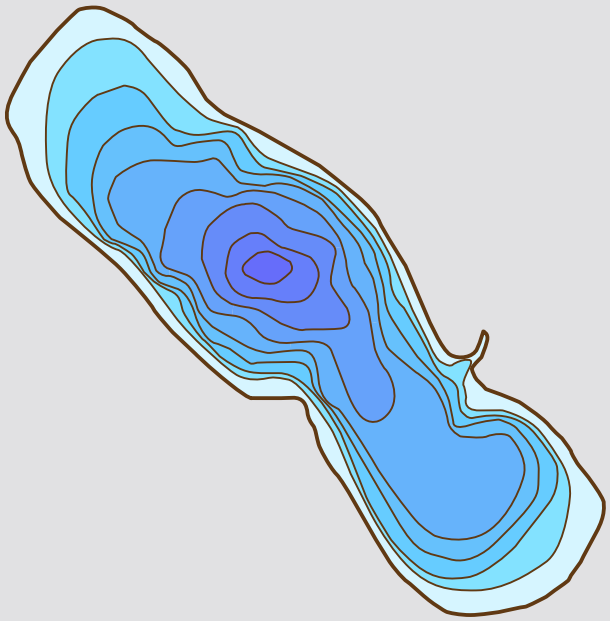
Goal TP Concentration:

60 ppb (State of MN),
85 ppb (SWWD)

Period of Record Trend:

IMPROVING

PRIMARY WATER RESOURCES OF THE DISTRICT



5 ft gradient intervals 750 ft N

POWERS LAKE

ID: 82-0092
Waterbody Area: 56 acres
Watershed Area: 1384 acres
Mean Depth: 16 feet
Max Depth: 41 feet

Water Quality:
3-year Average TP Concentration: 29 ppb
Goal TP Concentration:
40 ppb (State of MN),
29 ppb (SWWD)

Period of Record Trend:

STEADY

5 ft gradient intervals 750 ft N

RAVINE LAKE

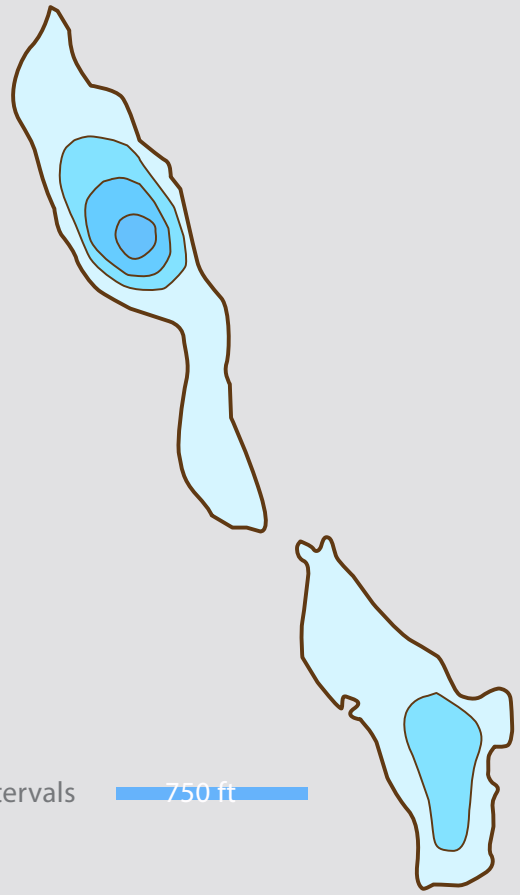
ID: 82-0087
Waterbody Area: 25 acres
Watershed Area: 802 acres
Mean Depth: 7 feet
Max Depth: 16 feet

Water Quality:
3-year Average TP Concentration: 65 ppb
Goal TP Concentration:
60 ppb (State of MN),
66 ppb (SWWD)

Period of Record Trend:

IMPROVING

PRIMARY WATER RESOURCES OF THE DISTRICT



5 ft gradient intervals

750 ft

N

WILMES LAKE

ID: 82-0090

Waterbody Area: 30 acres

Watershed Area: 3,242 acres

Mean Depth: 5 feet

Max Depth: 18 feet

Water Quality:

3-year Average TP Concentration: 76 ppb

Goal TP Concentration:

60 ppb (State of MN), 54 ppb (SWWD)

Period of Record Trend:

IMPROVING

O'CONNORS CREEK

ID: 82-0020 (LAKE); 07030005-608 (STREAM)

Waterbody Area: 23 acres

Waterbody Length: xxx ft

Watershed Area: 2,435 acres

Mean Depth: N/A

Max Depth (Lake): 11 feet

Water Quality:

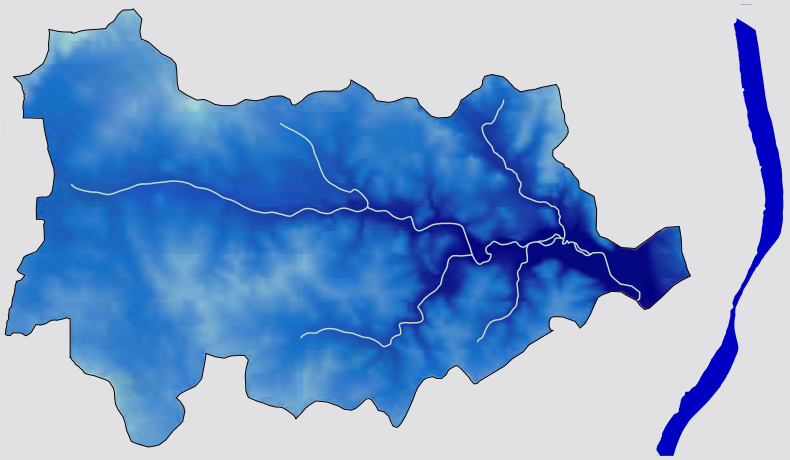
3-year Average TP Concentration: 23 ppb

Goal TP Concentration:

Lake: 60 ppb (State of MN), Stream: 100 ppb (State of MN)

Period of Record Trend:

STEADY

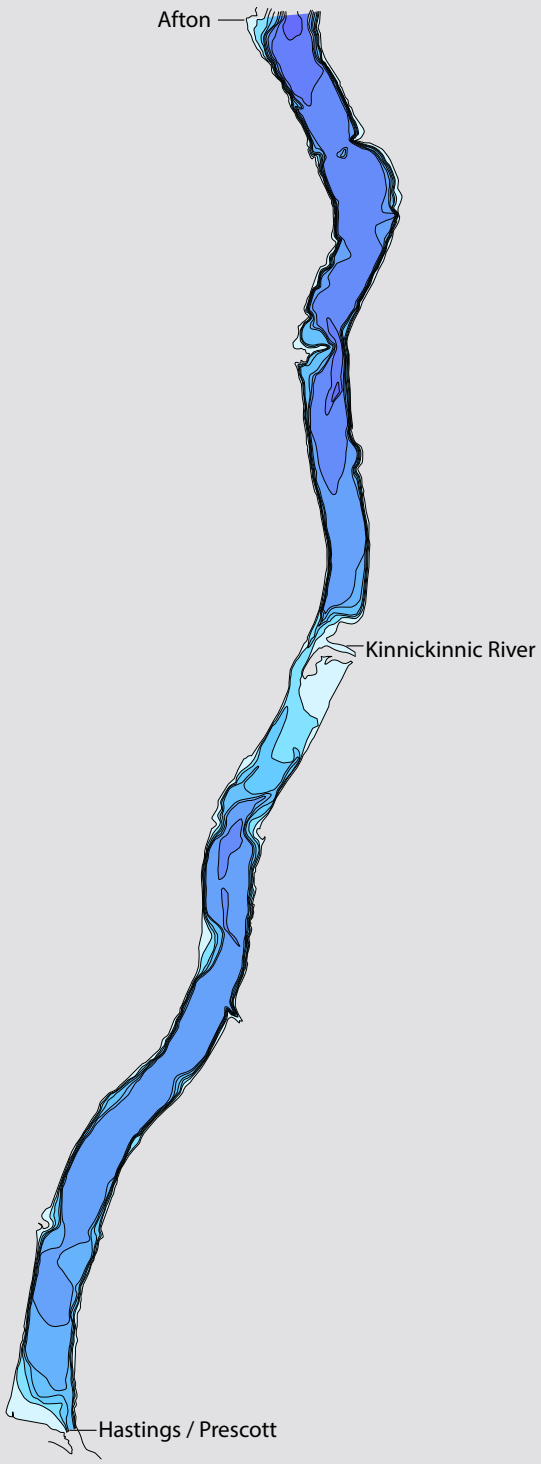


10 ft gradient intervals

7500 ft

N

PRIMARY WATER RESOURCES OF THE DISTRICT



10 ft gradient intervals

6500 ft

N

LAKE ST. CROIX

ID: 07030005

Waterbody Area: xx acres

Watershed Area (SWWD Portion): 7560 acres

Mean Depth: xx feet

Max Depth: 71 feet

Water Quality:

Annual Average TP Concentration: 41 ppb

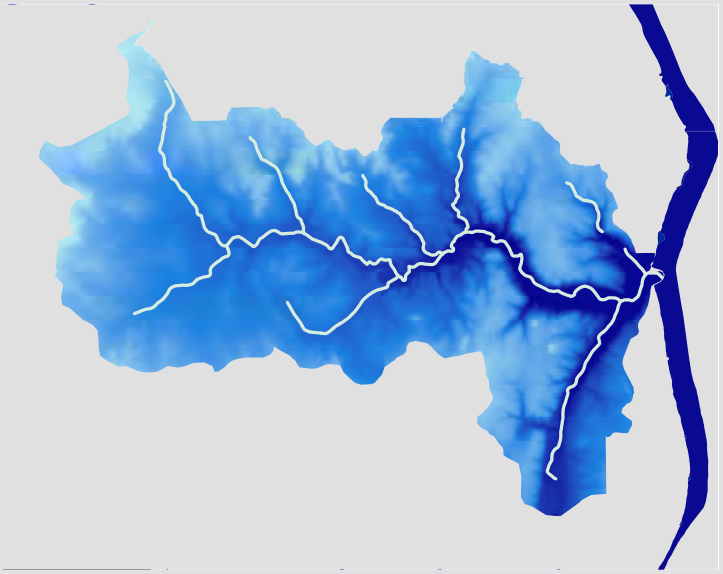
Goal TP Concentration:

40 ppb (State of MN)

Period of Record Trend:

IMPROVING

PRIMARY WATER RESOURCES OF THE DISTRICT



5 ft gradient intervals 7500 ft N

TROUT BROOK

ID: 07030005-568

Waterbody Length: xx feet

Watershed Area: 2,240 acres

Mean Depth: 5 feet

Max Depth: 8 feet

Water Quality:

Annual Average TP Concentration: 37 ppb

Goal TP Concentration: 100 ppb (State of MN),

Period of Record Trend:

DECLINING

5 ft gradient intervals 12,000 ft N

MISSISSIPPI RIVER

POOL 2

ID: 07010206

Waterbody Area: xx acres

Watershed Area (SWWD Portion): 19,371 acres

Mean Depth: N/A

Max Depth: N/A

Water Quality:

Annual Average TP Concentration: Unknown

Goal TP Concentration: 100 ppb (State of MN)

Period of Record Trend:

IMPROVING

PART II: ASSESSMENT OF ISSUES AND MEASUREABLE GOALS

ISSUE IDENTIFICATION

Development of past plans included extensive public participation processes to identify District issues. That work has served as the basis for District programs and projects since the 2007 Watershed Management Plan (WMP) was adopted. Beginning in 2013, several efforts were made to evaluate the status and success of existing District efforts and identify current and emerging issues all of which have led to the development of this current WMP.

In 2013, the SWWD Board of Managers held a workshop to discuss the status of the 2007 Plan and discuss changing and emerging issues. As a result of that workshop several changes to the Plan were identified and the District proceeded to develop a Plan amendment. Ultimately, however, the District decided to delay that amendment in deference to two pending actions at the State level—a state led assessment of District performance and update to MN Rule 8410 which governs Twin Cities metropolitan Watershed Districts.

The Board of Water and Soil Resources (BWSR) supports Minnesota's counties, watershed districts and soil and water conservation districts that deliver water and related land resource management projects and programs. In 2007 the BWSR set up a Performance Review and Assessment Program (PRAP) to systematically review the performance of these local units of government to ensure their effective operation. Each year BWSR staff conducts routine reviews of several of these local conservation delivery entities. In 2014, building on SWWD's own assessment in 2013, BWSR completed a PRAP assessment of SWWD. The conclusion of that assessment was:

> "The South Washington Watershed District (SWWD) is an effective agent for positive water resource management in a complex metropolitan environment. The district's systematic, deliberate approach to project development, as set out in their management plan and management processes, is impressive. The confidence that the cities within the district have in the organization's capabilities is evidenced by the gradual expansion of the district's jurisdiction as neighboring watershed management organizations have dissolved. The SWWD has been aggressive at applying the various tools and authorities available to a metro area watershed district in its pursuit of

effective local water and resource management. In general, the partner organizations find the SWWD good to work with and recognize the quality of its efforts. If there are any areas for improvement in the district's working relationship with its partners they would be in the area of improved communication about changing timelines or follow-through on projects or programs. The district meets an impressive 93 percent of BWSR's benchmark performance standards. This rate of compliance shows organizational sophistication, attention to detail in overall district management, and a commitment to service for the people who live in the district and to the resources they depend upon."

programs. RBA also sets up a routine evaluation mechanism which along with a willingness to adapt strategies and programs helps to ensure that an organization is making progress toward its goals. Ultimately, utilizing an RBA approach increases accountability. This section is organized to generally follow a Results Based Accountability approach. Each issue statement is followed by the desired outcome (goals/results), implementation progress indicators, and associated implementation programs. Additionally, each issue includes a section with live links to additional information from SWWD and its partners.

Ravine Lake Fishing Pier

In 2015, BWSR adopted an update to MN Rule 8410. That update resulted in several changes to what is and is not required in Watershed Management Plans. Ultimately, the revised rules allow for a condensed format that provides a more intuitive and user friendly document. With those changes, SWWD decided to undertake a Plan update process which resulted in creation of this Plan. Consistent with the revised (2015) MN Rule 8410, SWWD requested input from State and local review agencies regarding agency resource priorities and perceived issues in SWWD.

Building on input received from review agencies, SWWD engaged both a Citizen and Technical Advisory Committee. Those committees are formed, respectively, by District residents and representatives from municipalities and State and local agencies. Both committees were heavily leaned on to identify and evaluate issues presented in this section and develop implementation priorities and actions presented in Part III.

The following Issues and Goals are the result of the aforementioned process and reflect the priority resource issues of the District. Order does not convey importance. Washington County has recenty shifted to a Results Based Accountability (RBA) approach in setting up County programs. RBA starts with an end goal and works backwards to develop quantifiable indicators and

ISSUES AND GOALS: FLOODING

FLOOD DAMAGE REDUCTION AND MITIGATION

Issue: There are several areas within the District which are at risk for flooding during and following large precipitation and/or extended wet periods. Known areas are listed below.

Wilmes Lake: Volume driven residnential flooding during infrequent rainfall events. SWWD and the City of Woodbury have worked to flood-proof residences and continue to seek additional means to alleviate flooding risk.

City of Newport riverfront: A portion of Newport lies behind an uncertified and aging levy. The City has been working with affected landowners to purchase the properties with SWWD assistance. SWWD will continue to work with Newport as new flood concerns arise along the riverfront.

Cottage Grove Central Draw: Excessive inter-community flows from the Central Draw impact the West Draw subwatershed. SWWD continues to support City efforts to allevaite those flows and reduce flooding risk in the West Draw.

West Draw: As the West Draw subwatershed continues to develop concerns have risen about increasing inter-community flows from Woodbury into Cottage Grove. SWWD has worked with the Cities to identify flow limits and ensure that limits are met as development continues.

Clear Channel/TH61: The Clear Channel Pond in Cottage Grove is undersized. Under flood conditions, the pond overflows into St. Paul Park, impacting that community and transportation infrastructure. SWWD is working with the City of Cottage Grove to expand storage and alleviate flooding issues.

Ravine Park: The existing park road routinely floods due to inadequate infrastructure. SWWD and Washington County are working to reconstruct the roadway and lake outlet in 2017 to alleviate the issue.

SWWD has historically led or participated in these regional or inter-community flooding issues while assisting municipalities with their efforts to address more localized issues. The District's general approach begins with source reduction and continues with identification and protection of critical storage locations and floodplains as a means to reconstruct or mimic a more natural hydrograph. It is the District's policy to opportunistically manage floodplains for multiple, non-development uses (e.g. greenspace, recreation, and habitat). If source reduction approaches are not adequate or feasible, the District pursues mitigation measures ranging from flood-proofing property and infrastructure to support for property buyouts.

Goal: Minimize existing and future potential damages to property, public safety, and water resources due to flood events.

Flooding at Cottage Grove Ravine Regional Park

Implementation Indicators:

- Prevent increases in runoff from development activity through development and enforcement of District Rules;
- Prevent increases in flooding risk due to development (e.g. Wilmes, Ravine, and O'Conner's Lakes);
- Achieve no net loss in inventoried key flood storage areas;
- Achieve progress toward inter-community flow limits as development occurs;
- Maintain implementation flexibility to respond to identified flood damage reduction/mitigation needs that may arise.

Implementation Tools:

Planning, Regulatory, Implementation and Maintenance

Additional Information:

http://www.swwdmn.org/wp-content/uploads/2015/03/3-Assessment-of-Issues_Amended2011.pdf

ISSUES AND GOALS: FLOODING

CENTRAL DRAW OVERFLOW

Issue: One of the primary reasons SWWD was formed was to identify, design, and construct an outlet for the

East Ridge Regional Pond

District's Northern Watershed which includes one of the fastest growing communities in the State. At the time, runoff from the Northern Watershed collected at Bailey Lake which had no controlled outlet. Communities in the District recognized that Bailey Lake would not be adequate to contain all of the runoff from the watershed when it was fully developed. Since that time, SWWD and its partners have been working to construct the Central Draw Storage Facility (CDSF), which includes 1800 acre feet of storage on 250 acres near the outlet of Bailey Lake. A City of Woodbury lift station pumps water from Bailey Lake to the CDSF. With the size of the CDSF and rate/volume restrictions on development draining to Bailey Lake, the system should be adequate to retain the runoff for a 6.3", 24 hour rainfall event. However, because of uncertainty in design, recent trend of extreme precipitation events and degree of safety necessary for flooding situations, SWWD is in the process of constructing a controlled overflow out of the CDSF to the Mississippi River. The project is being implemented in 5 phases. Phases I (pipe connection under CSAH 19) and II (stream stabilization between Ravine Lake and Mississippi River) are complete.

Goal: Complete establishment of a controlled overflow from SWWD's Northern Watershed to the Mississippi River

Implementation Indicators:

- Phase III, modification of the Ravine Lake outlet by 2017;
- Phase IV, stabilization of Ravine Park by 2018
- Phase V, construction of remaining pipe sections by 2019;
- Completion of functioning overflow system by January 1, 2020 as specified in SWWD/Lower St. Croix WMO consolidation agreement, unless otherwise agreed to by Cottage Grove, Woodbury, and SWWD.

Implementation Tools: Implementation and Maintenance

Overflow Phase II Streambank Stabilization

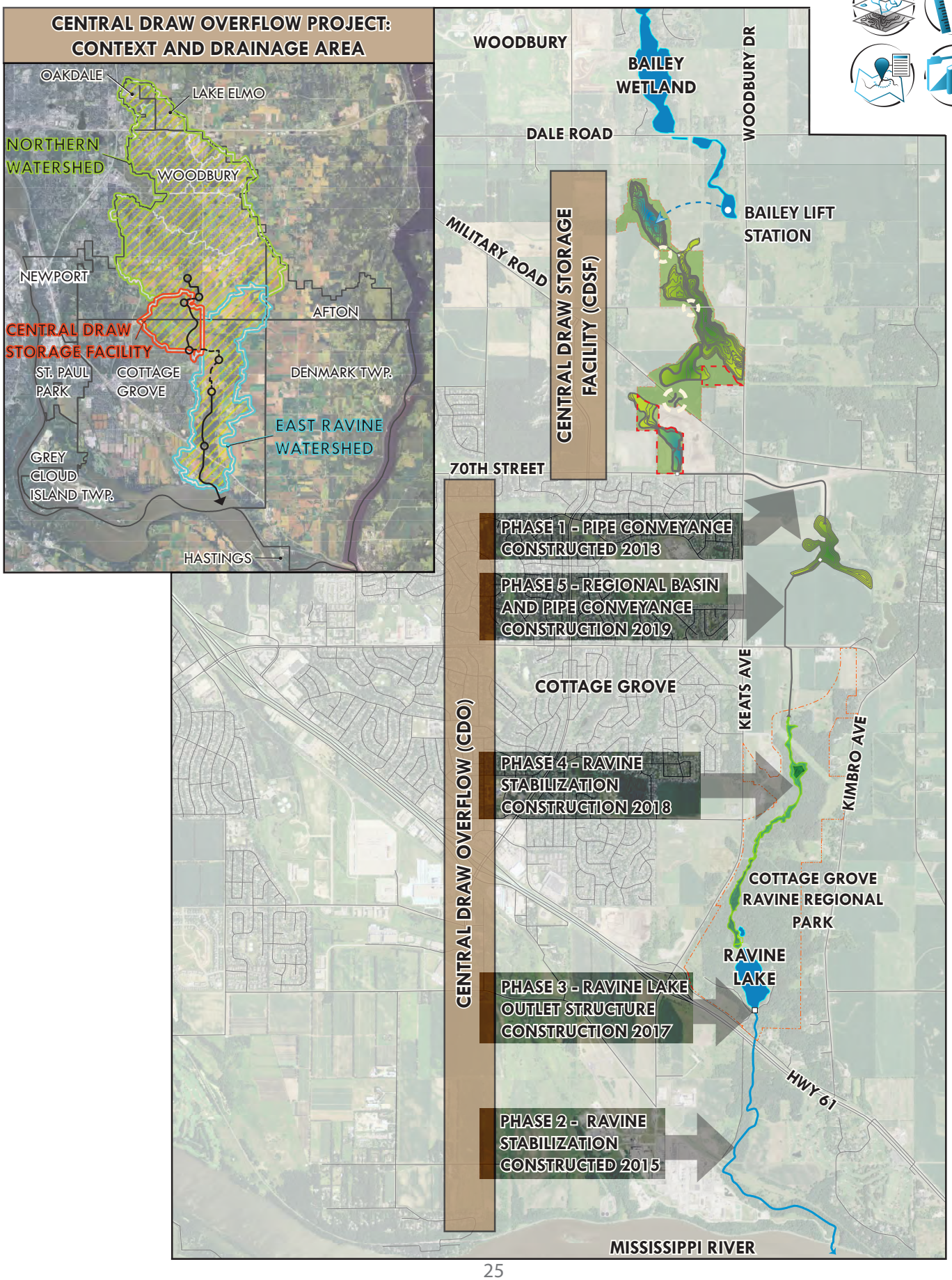
Additional Information:

http://www.swwdmn.org/wp-content/uploads/2016/04/2013_BoDR_100913.pdf

http://www.swwdmn.org/wp-content/uploads/2016/04/SWWD-Greenway-Corridor-Plan-2000.pdf

http://www.swwdmn.org/wp-content/uploads/2016/04/Central-Draw-Storage-Facility-Overflow-Project-EAW_Phases-2-5.pdf

http://map.swwdmn.org/storymap/index.html

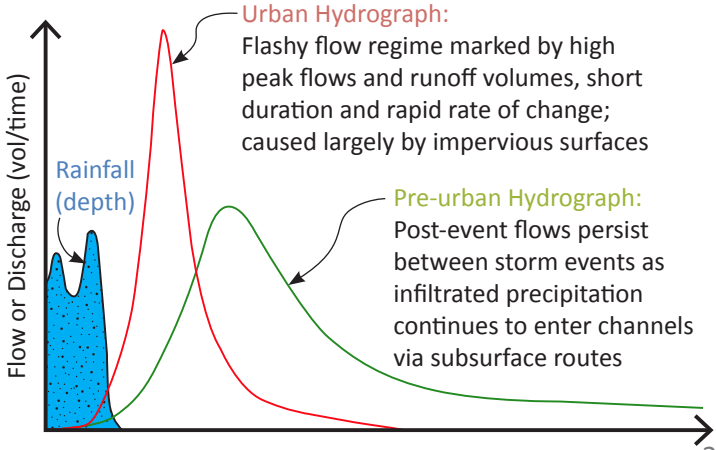

CENTRAL DRAW OVERFLOW PROJECT:
CONTEXT AND DRAINAGE AREA
OAKDALE
LAKE ELMO
NORTHERN
WATERSHED
WOODBURY
NEWPORT
AFTON
CENTRAL DRAW
STORAGE FACILITY
ST. PAUL
PARK
COTTAGE
GROVE
DENMARK TWP.
EAST RAVINE
WATERSHED
GREY
CLOUD
ISLAND TWP.
HASTINGS
WOODBURY
BAILEY
WETLAND
WOODBURY DR
DALE ROAD
BAILEY LIFT
STATION
MILITARY ROAD
CENTRAL DRAW STORAGE
FACILITY (CDSF)
70TH STREET
PHASE 1 - PIPE CONVEYANCE
CONSTRUCTED 2013
PHASE 5 - REGIONAL BASIN
AND PIPE CONVEYANCE
CONSTRUCTION 2019
COTTAGE GROVE
KEATS AVE
KIMBRO AVE
CENTRAL DRAW OVERFLOW (CDO)
PHASE 4 - RAVINE
STABILIZATION
CONSTRUCTION 2018
COTTAGE GROVE
RAVINE REGIONAL
PARK
RAVINE
LAKE
PHASE 3 - RAVINE LAKE
OUTLET STRUCTURE
CONSTRUCTION 2017
HWY 61
PHASE 2 - RAVINE
STABILIZATION
CONSTRUCTED 2015
MISSISSIPPI RIVER

ISSUES AND GOALS: WATERSHED ALTERATIONS

SURFACE WATER DEGRADATION AND IMPAIRMENT

Issue: Typical of urban systems, District water resources are significantly affected by land use and changes in land cover. What was once wetland, prairie, savanna, and forest is now suburban development and agriculture, both of which pose several challenges. Both increase rate and volume of runoff (Fig 5) to district resources, carrying with it sediment, debris, and nutrients which degrade or impair natural aquatic systems. Both require very different approaches to address however. Suburban development is highly regulated and results in highly impervious areas with fragmented open space and high infrastructure costs. Agricultural lands have comparatively low regulation and result in significant land cover changes over large land areas with comparatively low infrastructure costs. These differences create a dynamic where it is easier to implement more costly improvements in suburban areas through regulation than in agriculture lands through voluntary implementation. Cost effective implementation requires overcoming that dynamic.

SWWD believes in proactively coordinating with its constituents for long-term surface water planning and implementation of projects toward the protection and restoration of District resources. Key to that function is management planning. SWWD systematically assesses its resources through its monitoring and modeling efforts. Building on those efforts, the District then develops management plans focused on protection or restoration for impaired waters. The management plans are developed and adopted by the District as guidance documents. Following an adaptive management approach, SWWD routinely revisits completed plans to evaluate progress and re-assess strategies in light of new or changing information. Implementation of management strategies and practices identified in management plans is implied and authorized through this Watershed Management Plan (WMP). And although exact practices may not currently be known or may change, the process for identifying and implementing those practices as well as the funds to do so are explicit within this WMP.



SWWD management plans and guidance documents cite two different water quality goals for lakes--the applicable State standard and SWWD's 2007 goal. SWWD goals were developed for District managed resources in 2007 based on broadscale watershed and in-lake modeling. Those goals were though at the time to represent what was feasible through watershed management. Since that time, SWWD has refined its managmenet approach which now uses finer modeling techniques and follows a robust retrofit analysis and implementation process. All current management plans are developed based on the State standard except where SWWD's goal is more restrictive (i.e. Powers Lake). SWWD goals are still documented in SWWD management plans as a means to show progress against SWWD's initial resource goals.

SWWD recognizes the inherent difficulty for local agencies in addressing emerging, widespread contaminants and impairments of regional resources extending beyond local jurisdictions. Clear, existing examples include the Mississippi River turbidity impairment, Lower St. Croix excess nutrients impairment, and widespread Metro area chloride contamination. For these larger and more widespread resources and impairments the District recognizes the importance of planning at a level broader than the District but continues to place high value and importance on local implementation. SWWD will assist in implementation of TMDLs for State or regional resources or impairments which extend beyond District boundaries. Likewise, SWWD will evaluate potential impact of emerging contaminants and seek guidance from State and Regional agencies in addressing those impacts.

Goal: Protection and restoration of District resources to meet local resource goals and State standards.

Implementation Indicators:

- Adoption of completed TMDLs for Statewide and Regional resources for which implementation actions are identified for SWWD;
- Colby Lake: Restore Colby Lake to state eutrophication

ISSUES AND GOALS: WATERSHED ALTERATIONS

standards by reducing the growing season total phosphorus load by 156 kg.

- Wilmes Lake: Restore North and South Wilmes Lake to state eutrophication goals by reducing the growing season total phosphorus load by 49 and 12 kgs, respectively. SWWD goals exceed State Standards.
- Powers Lake: Protect Powers Lake from exceeding state eutrophication standards by maintaining existing watershed phosphorus load.
- Armstrong Lake: Protect Armstrong Lake from exceeding state eutrophication standards by reducing the growing season total phosphorus load by 5 kg.
- Markgrafs Lake: Restore Markgrafs Lake to state eutrophication standards by reducing the growing season total phosphorus load by 48 kg.
- Ravine Lake: Restore Ravine Lake to state eutrophication standards by reducing the growing season total phosphorus load by 22 kg at full build-out through enforcement of established total phosphorus loading standard.
- Mississippi River: Meet proposed TMDL loading rate of 154 lbs/ac/yr of Total Suspended Solids;
- Lake St. Croix: Achieve 36%, or approximately 700 lbs of total phosphorus load reduction for Trout Brook as specified in the Lake St. Croix TMDL.
- No net loss in wetland acreage or function;
- Protect/promote soil health as part of District projects and through District rules as a means to limit hydrological impacts of land alteration.
- Continue existing Incentive programs to encourage voluntary implementation of BMPs;
- Coordinate CIP plan with Municipalities through engagement of a standing Technical Advisory Committee and implementation of the District's CCIP program;
- Evaluate impact of emerging contaminants and identify District programs or actions to control or mitigate that risk.

Mass Grading of Dancing Waters in Woodbury

Implementation Tools: Assessment and Planning, Regulatory, Implementation and Maintenance

Additional Information:

http://www.swwdmn.org/wp-content/uploads/2016/04/Colby-Lake-Modeling-Report.pdf

http://www.swwdmn.org/wp-content/uploads/2016/03/Final-Armstrong-Markgrafs-Wilmes-Report.pdf

http://www.swwdmn.org/wp-content/uploads/2016/03/Grey-Cloud-Slough-Feasibility-Report-Final.pdf

http://www.swwdmn.org/wp-content/uploads/2016/03/OConnersStreamandLakeManagementPlan.pdf

http://www.swwdmn.org/wp-content/uploads/2016/03/PowersLakeMgmtPlanMay2010_JHL.pdf

http://www.swwdmn.org/wp-content/uploads/2016/03/Ravine-Lake-Mngmnt-Report-Final.pdf

http://www.swwdmn.org/wp-content/uploads/2016/03/Trout-Brook-Mgmt-Plan.pdf

http://www.swwdmn.org/wp-content/uploads/2016/03/Trout-Brook-Watershed-Improvements-Concept-Design-Report.pdf

http://www.swwdmn.org/wp-content/uploads/2016/03/DRAFT_Wetland_Mgmt_Plan_2002_SWWDVERSION.pdf

https://www.pca.state.mn.us/water/metro-area-chloride-project-history

ISSUES AND GOALS: WATERSHED ALTERATIONS

EROSION


Newport Ravine Before Stabilization


Newport Ravine After Stabilization

Issue: Bluffs, streambanks, and shorelands are highly susceptible to erosion. Further, once erosion begins, it typically becomes severe due to highly erosive soils and high velocities and concentration of flows commonly seen at these features. One of the simplest ways to prevent erosion of bluffs, streambanks, and shorelands, is to maintain a buffer which prevents erosion in two ways; (1) by intercepting and slowing velocity of runoff and minimizing concentration of flow, and (2) by increasing stability of native soils. Most of SWWD's lakes and streams carry the State's shoreland designation which subjects adjoining lands to Municipal and/or County shoreland ordinances. Those ordinances have long carried buffer requirements. On top of those requirements, the State has now added additional legislation meant to increase compliance enforcement.

Under new legislation, the MnDNR is required to map public waters requiring buffers, the Washington Conservation District will be required to inspect lands along identified waters to determine compliance, and SWWD is given enforcement responsibility. SWWD will work with its local partners to develop local programs and partnerships to implement the new buffer legislation.

Also integral to maintaining streambank and shoreland errosion is mitigation of changing hydrologic conditions resulting from development, resource use, or climate. Increases in runoff rates and/or volume may increase in-channel flows beyond what the channel is capable of conveying. Likewise, changes in surface water levels or artificial increase in wave-action may expose bare or unstable soils to erosive forces.

Finally, while construction site erosion and sediment control is a focus of the MN Pollution Control Agency and Municipalities, it remains an concern. Erosion of active construction sites is ineveitable. However through use of identified best management practices (BMPs) the extent of that erosion and its impact on District resources can be minimized. SWWD assists its Municipalities in ensuring that construction sites comply with established erosion and sediment control standards and utilize appropriate BMPs.

Goal: Prevent resource degradation of District resources from bluff, streambank, shoreland, and construction site erosion.

Implementation Indicators:

- In partnership with State and Municipal programs, promote and ensure erosion and sediment control compliance at active construction sites.
- Develop and implement buffer regulatory measures to comply with State requirements;
- Establish and maintain a 50 foot, permanently vegetated buffer along all bluffs, ravines, lakes, and streams;
- Identify and prioritize actively eroding ravines and address as budget allows;
- Maintain and enforce rules which prevent increased channel instability due to development;
- Work with landowners to stabilize eroding streambanks and shorelines.

Implementation Tool: Planning, Implementation and Maintenance, Regulatory

Additional Information:

www.mnwcd.org

http://www.dnr.state.mn.us/buffers/index.html

ISSUES AND GOALS: GROUNDWATER SUSTAINABILITY

SUPPLY

Issue: Groundwater supply is a known issue for South Washington County with documented aquifer depletion. SWWD views supply as a Municipal issue, however it does value its role in preserving groundwater quality and quantity. And, although many questions remain about how much water can be sustainably withdrawn from aquifers there is consensus on the need for conservation. SWWD is committed to implementing and improving conservation efforts to ensure long term viability of groundwater resources in South Washington County. The MnDNR North & East Metro Groundwater Management Area Plan provides a breakdown of groundwater use by category (Figure 6). The breakdown includes water use across the entire North & East area (roughly, Washington, Ramsey, and SE Anoka Counties) which share groundwater resources. Of particular concern in Southern Washington County is the amount of water used for irrigation (golf course, landscape, and agricultural) and pollution containment.

Goal: Implement conservation efforts to ensure long term viability of groundwater resources in South Washington County.

Implementation Indicators:

- Implement local actions identified in the Washington County Groundwater Plan;
- Implement conservation actions identified in regional planning efforts;
- Incentivize practices that reduce demand on groundwater supply;
- Promote and incentivize feasible re-use of water;
- Promote use of infiltration as a tool for recharge where appropriate;
- Evaluate feasibility of active recharge.

Implementation Tool: Planning, Implementation and Maintenance

Additional Information:

http://files.dnr.state.mn.us/waters/gwmp/area-ne/gwma_ne-plan.pdf

http://www.co.washington.mn.us/DocumentCenter/View/794

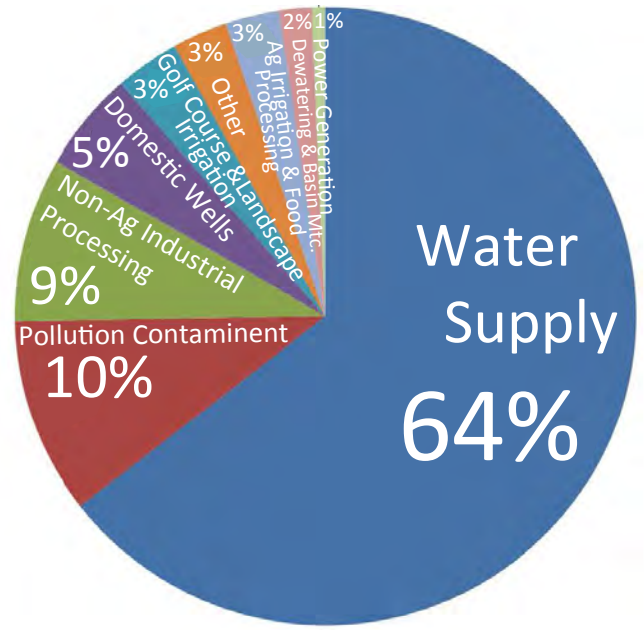


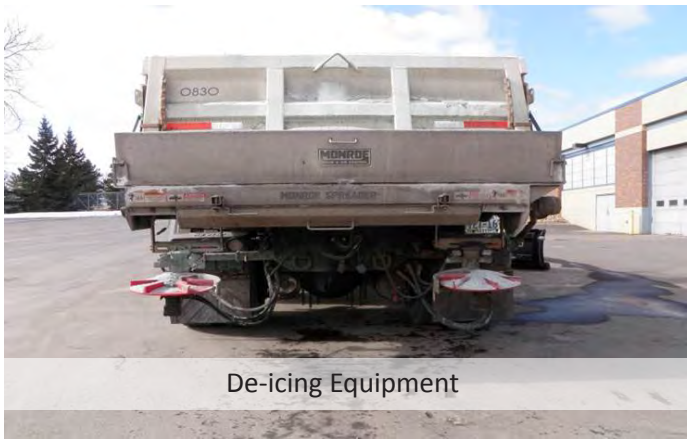
Figure 6: Groundwater use by category [North and East Metro Groundwater Study (2014)]

ISSUES AND GOALS: GROUNDWATER SUSTAINABILITY

PROTECTION (POLLUTION PREVENTION)

Issue: District residents rely on groundwater for 100% of their water supply. Because of that, SWWD and its local partners--led by the Washington County Groundwater Plan--place great emphasis on protecting groundwater resources from potential pollution. Those efforts include wellhead protection (Municipalities), special well construction areas (Lake Elmo/Oakdale), and pollution remediation (3M). SWWD is committed to preventing pollution from stormwater BMPs and local operations (i.e. large scale infiltration, de-icing operations, karst, etc.). Additionally, there are several known connections between surface water and groundwater resources in the District. SWWD is committed to continued assessment of those connections and the risks associated with them in partnership with the County and State partners.

Dancing Waters Sinkhole



De-icing Equipment

Despite, high interest in local implementation and known issues, there are many unkowns. There is a great need for coordination of local implementation efforts and resource assessment. While the District views that coordination and assessment as primarily a State responsibility, it is committed to participating. Until those opportunities present themselves, SWWD will continue to focus on pollution prevention.

Goal: Protect groundwater resources through pollution prevention and management of surface water, groundwater interactions.

Implementation Indicators:

- Implement local actions identified in the Washington County Groundwater Plan;
- Continue enforcement of existing karst rules;
- Consider pollution potential in siting and design of District funded stormwater BMPs;
- Utilize alternative compliance sequencing for meeting District development rules in areas where infiltration is not appropriate;
- Participate in State and regional efforts to quantify risks to groundwater resources from de-icing operations;
- Incentivize road authority upgrades to de-icing operations to prevent overuse of roadsalt;
- Continue groundwater quality monitoring at District regional infiltration facilities sufficient to identify potential impacts to groundwater from large scale infiltration practices.
- Consider additional protection of surface water features with potential to impact groundwater quality with guidance from State Agencies.

Implementation Tool:

Planning, Regulatory, Implementation & Maintenance

Additional Information:

http://www.co.washington.mn.us/DocumentCenter/View/794 (County Groundwater Plan)

https://www.pca.state.mn.us/water/road-salt-and-water-quality

ISSUES AND GOALS: NATURAL RESOURCES


Ravine Lake

Issue: Several of the issues facing District resources are caused by changes to the landscape. Loss of unique or rare habitats, threats to pollinators, habitat fragmentation, and changes in land use and land cover all encroach on District resources and decrease habitat diversity and ecological resilience. That change often translates as decreased groundcover density and quality causing increases in runoff volumes and rates as well as sediment and nutrient concentrations and degraded aquatic habitat. Therefore, one of the simplest solutions for the District's resource issues is protection and restoration of native terrestrial habitat.

Aquatic habitat is essential to healthy lakes and streams. Aside from watershed influences which can increase productivity in lakes and streams and bury habitat features in sediment, aquatic habitat is also strongly affected by invasive aquatic plant species and unbalanced fish communities which favor fish like black bullhead and sunfish which may increase disturbance of lake sediments.


Rich Fen at Ravine Lake

SWWD is committed to preserving and where feasible restoring native terrestrial and aquatic habitat. Every effort will be made in District projects and programs to achieve that result.

Goal: Protect, restore, and reconstruct native terrestrial and aquatic habitat for the benefit of resource management.

Implementation Indicators:

- Participate in development of regional programs to address spread and management of invasive terrestrial and aquatic invasive species;
- Implement local actions identified in regional planning efforts;
- Avoid impacts to rare, unique, and high quality habitats as part of all District projects;
- Maintain natural buffers or riparian areas on all District water resources;
- Promote use of site appropriate native plants as part of District funded projects;
- Promote compliance with guidance for pollinator friendly design practices as part of District funded projects;
- Consider preservation or restoration of native habitat and benefits to pollinators and other wildlife in allocation of incentive funding.
- Evaluate potential credit mechanisms to incentivize developers to maintain mature trees during development within 3 years;
- Implement habitat improvement practices identified in completed Resource Management Plans.
- **Implementation Tool:** Implementation and Maintenance, Regulatory, Planning

Additional Information:

ISSUES AND GOALS: CLIMATE CHANGE

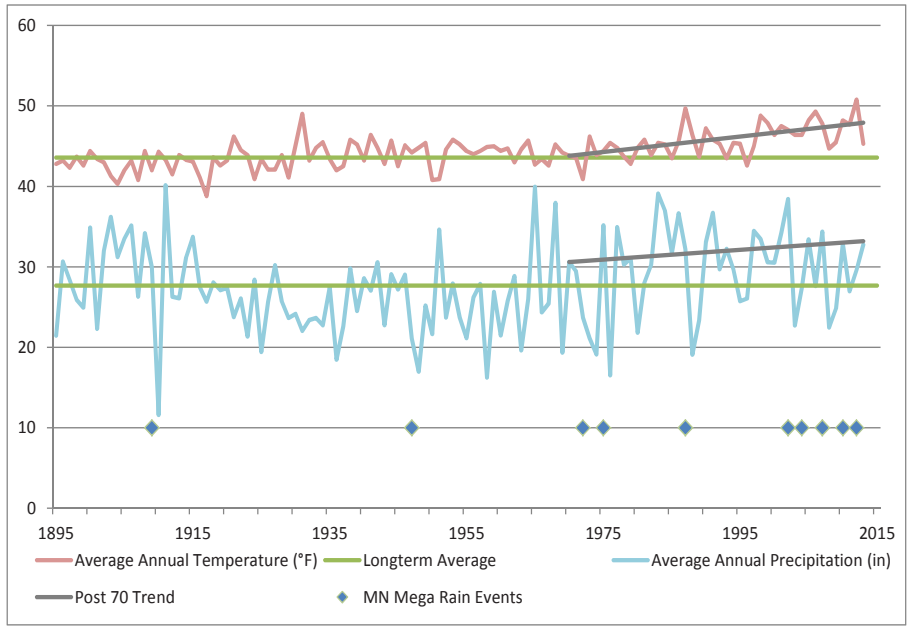


Figure 7: Minneapolis/St. Paul precipitation and temperature trends, NOAA National Climate Data Center

Issue: Minnesota's climate is changing (Fig 7)—precipitation patterns are increasingly variable with extremes (i.e. drought and flooding) more common, growing seasons are expanding, winters are warmer and thereby increasing stress on infrastructure due to increasing freeze/thaw patterns and fostering increased survival of damaging pests. These changes are also reflected in risks to District resources. More frequent precipitation extremes will increase fluctuations in lake levels and increase rates of runoff and flow in streams. Those changes are reflected in increasing field and streambank erosion and increased demand on regional water supply provided by already stressed aquifers. Depressed water levels in lakes, streams, and wetlands during prolonged droughts will result in changing surface water/groundwater interactions. And, increasing growing seasons will result in additional nuisance algal conditions in already impaired waters.

While efforts at the national and international level have traditionally focused on mitigation of climate change, SWWD and other State and Local agencies are increasingly focused on climate adaptation. Through adaptation, SWWD and its partners and residents can prepare for anticipated challenges to ensure healthy resources and sustained water supply.

Goal: Facilitate increasing resilience of District resources and public infrastructure through development of information and strategies and implementation of accepted climate adaptation practices.

Implementation Indicators:

- Consider adaptive capacity—ability of a system to adjust to climate change to mitigate potential damages, take advantage of opportunities, or cope with consequences—of District systems and resources in developing projects;
- Require use of up to date hydrologic data for meeting District development and redevelopment standards;
- Utilize District surface water modeling and County Groundwater model to explore changes in surface water/groundwater interactions as a result of predicted changes in hydrologic conditions and water demand;
- Utilize District CCIP program to assist Cities in adapting their infrastructure systems to increase resiliency—capability to anticipate, prepare for, respond to, and recover from significant threats with minimum damage to social well-being, the economy, and the environment;
- Promote use of alternative landscapes which require less water;
- Promote water re-use where feasible to reduce demand on aquifers;
- Work with local partners to improve delivery of soil conservation programs to prevent increased field erosion.

Implementation Tool: Planning, Education, Implementation and Maintenance

Additional Information:

https://www.pca.state.mn.us/air/climate-change

http://www.wicci.wisc.edu/

ISSUES AND GOALS: INFORMATION AND EDUCATION

RESOURCE ASSESSMENT

Issue: The District utilizes an adaptive management approach to watershed and resource management. Key to that approach is reliable and relevant feedback data that accurately characterize District resources and changes in water quality and quantity.

Goals:

- In partnership with Local, State, and Regional partners, operate a monitoring program adequate to establish baseline water quality and quantity measures and identify long-term trends.
- Operate a monitoring program adequate to detect changes in loading rates as a result of District implementation actions.

Implementation Indicators:

- Maintain equipment inventory to quickly establish additional monitoring locations in response to identified resource concerns;
- Biennially, complete trend analyses for all lakes and Regional Assessment Locations and complete a review of the District's Monitoring Plan;
- Expand groundwater monitoring program in partnership with Washington County, MnDNR, MDH, and MPCA to adequately characterize groundwater resources in the District;

Implementation Tools: Implementation and Maintenance Program

Additional Information:

http://www.swwdmn.org/programs/monitoring-program/

http://wq.swwdmn.org/


Typical Monitoring Installation


In-stream Monitoring

ISSUES AND GOALS: INFORMATION AND EDUCATION

DISTRICT-WIDE HYDROLOGIC MODELING

Issue: Nearly all resource management decisions now require some degree of modelling on the front end to ensure that efforts are targeted and cost-effective. Additionally, SWWD and its partners rely on modeling for predictive analysis of changing conditions (i.e. planned development, climate change). SWWD believes that modelling is best initiated and maintained at the watershed level.

Goal: Maintain updated, District-wide hydrological modeling to inform District and Municipal management of resources and infrastructure.

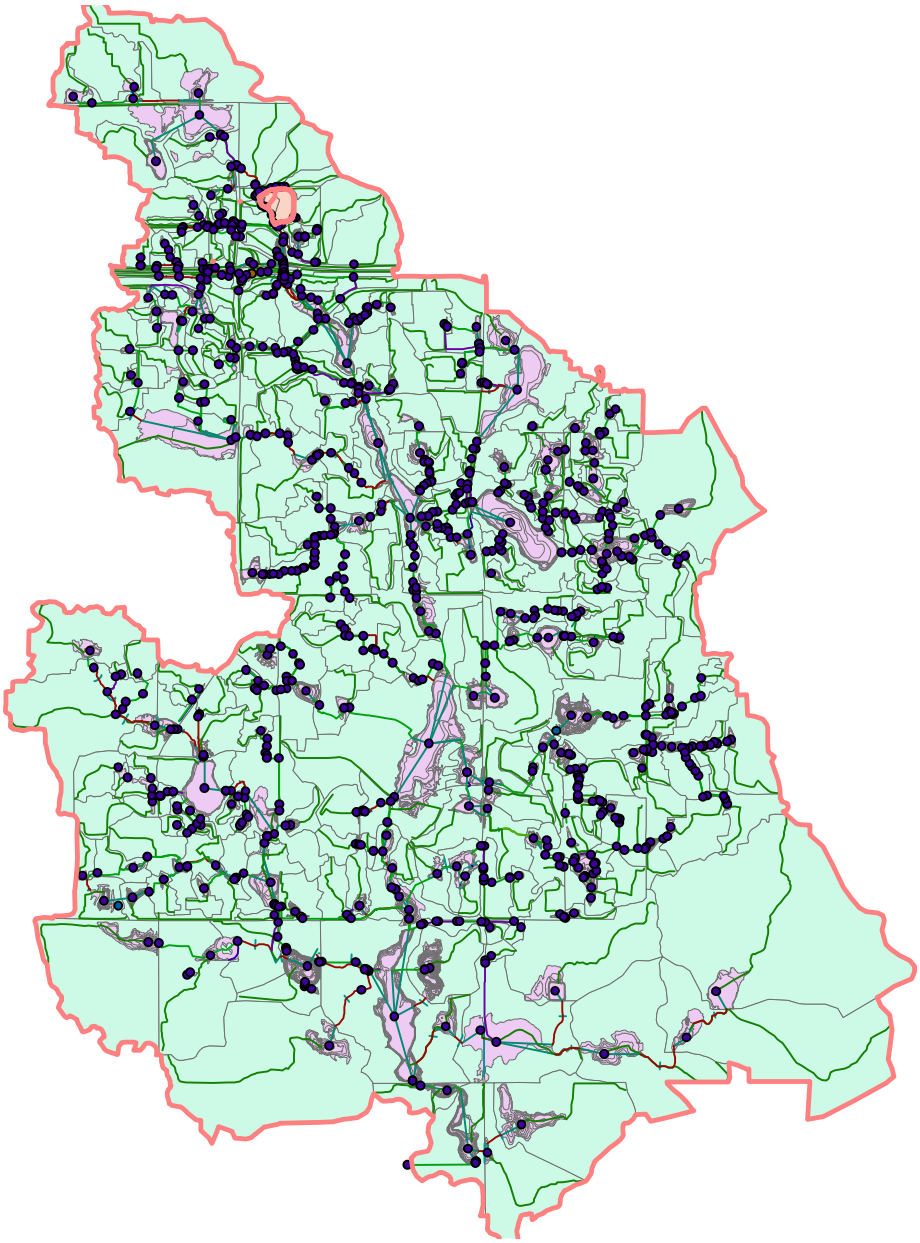
Implementation Indicators:

- Complete development of subwatershed models to complete District-wide coverage within 6 years;
- Calibrate completed models to collected monitoring data once every 3 years.
- Promote use of District models and modeling specifications through dissemination on SWWD website.

Implementation Tool: Assessment and Planning

Additional Information:

SWWD Modeling Spec/Library



Hydraulic Model (XPSWMM) Viewer for the Northern Subwatershed

ISSUES AND GOALS: INFORMATION AND EDUCATION

RESEARCH

Issue: Information and dissemination of information is essential to effective implementation of District's adaptive management approach in addressing resource issues. SWWD continuously strives to develop and improve information and refine delivery methods. Several knowledge gaps have been identified and are grouped into the following categories:

- Effective incorporation of emerging Best Management Practices into existing Public Works systems and management paradigms
- Methods for source reduction in agriculture land use
- Alternative crops and buffers
- Evaluation of emerging Best Management Practices
- Refinement of existing Best Management Practices
- Integration of water quality and habitat Best Management Practices
- Effective incentives for implementation of various Best Management Practices
- Control of invasive and unwanted species
- Impacts of regional infiltration on groundwater

SWWD will pursue collaborative research opportunities to address known gaps in knowledge. SWWD's primary tool disseminating information is its website. The District's website includes interactive mapping and water quality database applications. Additionally, the website serves as an online library for all documents identified in this plan. It is the District's intention to serve as a primary source for information related to condition and management of resources within the District. To facilitate that role, SWWD will continue to develop web applications and evaluate new technologies for incorporation into the District's website.

Goal: Work with local and regional partners to advance knowledge of watershed management issues.

Implementation Indicators:

- Further identify and refine research and information needs as ongoing role of Technical Advisory Committee;
- Pursue research opportunities to provide for identified information needs;
- Biannually publish summary of completed and ongoing research efforts.

Implementation Tool: Education and Information

Additional Information:

http://www.mnwcd.org/emwrep/

http://www.swwdmn.org/

http://www.eorinc.com/documents/AG-BMPHandbookforMN_09_2012.pdf

ISSUES AND GOALS: INFORMATION AND EDUCATION

EDUCATION

Issue: Informed residents and cities are essential for establishment of reasonable resource expectations and successful implementation of District programs. Since it formed, the District has been working to educate its constituents about the direct and indirect impacts they and their actions have on District resources. Those efforts continue and now involve more partners. SWWD and other water management organizations in the County have long pooled resources toward a shared education program. Increasingly, Municipalities are joining that effort as a means to achieve their own resource goals and comply with State permit requirements. It is the District's intention to continue to work jointly with its partners to develop and deliver a coordinated, comprehensive education program. To that end, SWWD maintains its partnership and involvement in the East Metro Water Resources Education Program (EMWREP).

The need for a District Learning Center at the District's Central Draw Storage Facility has been identified. The center would provide for mulitple uses including education, trailhead faciliites, and neighborhood gathering space. SWWD will continue to explore that need and opportunities for shared use with Washington County, City of Woodbury, and Non-governmental organizations.

Goal: Heighten the awareness of key constituencies within the District, sufficient to modify behavior to improve the recognition and implementation of District policies, programs, and activities.

Implementation Indicators:

- Actively participate in regional education efforts as an active partner in the East Metro Water Resources Education Partnership (EMWREP);
- Develop District facilities for use as interpretive and educational sites, including a District Learning Center at the Central Draw Storage Facility;
- Develop shared interpretive and educational programming for use at Municipal and District facilities focused on identified District issues;
- Engage local public, private, and NGO partners to develop experiential programming for children;
- Maintain a website to disseminate consistent information and coordinate program implementation;
- Utilize existing Municipal committee structure to educate residents and disseminate information as part of the District's Citizen Advisory Committee;
- Develop a mechanism to gauge effectiveness of educational programming efforts.

Implementation Tool: Education and Information; EMWREP

Additional Information:

http://www.mnwcd.org/emwrep/

http://www.swwdmn.org/

Volunteer Tree Planting at SWWD Prairie

ISSUES AND GOALS: EFFICIENCY AND ACCOUNTABILITY

PROGRESS EVALUATION

Issue: SWWD utilizes an adaptive management approach to managing its resources. Likewise, it utilizes a results based accountability (RBA) approach to evaluating District programs. Key to both is routine evaluation of progress. SWWD is committed to routine, objective evaluation of District programs and projects.

A RBA approach relies on the establishment of clear, measureable goals and objectives, documentation of strategies, collection of data, objective performance evaluation, and willingness to modify programs as necessary. The format of this plan establishes a process for SWWD to carry out a RBA evaluation approach.

Identified issues establish an overriding goal or result that the District is persuing. Because those goals are too often unmeasureable typical plan timelines, several implementation indicators are also established. Progress toward implementing inducators is assumed to indicate progress toward the goal. Programs are established similary to facilitate evaluation of program performance. However, instead of goals and implementation indicators, programs are built around a purpose and performance measures.

Progress toward addressing identified issues and goals and program performance are evaluated annually as part of the District's annual reporting. Additional information about reporting can be found in Part III: Admimistration. Sample evaluation forms can be found in Appendix B.

Goal: Utilize a Results Based Accountability approach in evaluating and refining implementation strategies for achieving resource goals and to evaluate and improve program performance.

Implementation Indicators:

- Ongoing development and use of documented strategies and actions to achieve established resource goals;
- Incorporate strategy documentation, progress evaluation, and annual workplan into annual report;
- Amend Watershed Plan as necessary to provide the District with and programs and tools necessary to implement identified strategies.

Implementation Tool: Planning, Implementation and Maintenance

Additional Information:

www.swwdmn.org

ISSUES AND GOALS: EFFICIENCY AND ACCOUNTABILITY

UNIFORM STANDARDS

Issue: SWWD believes that primary control and determination of appropriate land use is the responsibility of municipalities. Likewise, the District believes the permitting process is best performed at the municipal level. However, one of the primary purposes of Watershed Districts is to manage resource issues that cross municipal boundaries or otherwise become too big for individual jurisdictions to address. Additionally, the District views its water resources as regional resources and values its role in preventing impacts to those resources from development. SWWD's primary tool for addressing these issues is uniform design standards—Rules—which the District is authorized to develop under State Statute. Municipalities within the District are required to adopt controls to enforce those standards.

Ultimately, the District believes that standards based on local resource goals and that consider variability in soil and land cover conditions are best. However, the District does recognize the difficulty for municipalities, residents, and businesses to navigate standards across Watershed District boundaries. To the extent possible, SWWD will seek to achieve uniformity in Standards across District boundaries, although varying resource issues may make that infeasible.

Finally, the District recognizes its responsibility in implementing State programs (e.g. TMDLs) and permits (e.g. MS4) and seeks to simplify the inherent overlap of regulatory jurisdictions and eliminate duplication of efforts where possible.

Goal: Establish and maintain District controls necessary to achieve established District resource goals, comply with mandated permits and programs, and maximize regulatory consistency with neighboring jurisdictions.

Implementation Indicators:

- Regularly review and update District Rules as necessary to keep pace with changing resource issues and mandated regulatory programs;
- Ensure uniform MS4 program coverage across District using a documented cooperative approach that limits duplication of efforts;
- Work with neighboring Watershed Districts to develop uniform standards where possible;
- Require municipal adoption of District Rules within 2 years of any completed update;
- Prevent degradation of resources.

Implementation Tool: Assessment and Planning, Regulatory

Additional Information:

http://www.swwdmn.org/wp-content/uploads/2016/03/2015SWWDRules-1.pdf

http://www.swwdmn.org/wp-content/uploads/2016/03/ENV-GWGovernance_201209281246333876.pdf

http://www.swwdmn.org/wp-content/uploads/2016/03/SWPPP_2014.pdf

ISSUES AND GOALS: EFFICIENCY AND ACCOUNTABILITY

COLLABORATION AND COORDINATION OF EFFORTS

Issue: Minnesota is advanced in management of water resources. However, the framework of local, regional, and state jurisdictions which empower Minnesota to respond to water resource issues also results in a high degree of overlap in regulatory jurisdictions and responsibilities. SWWD believes implementation is generally best achieved at local levels of government and approaches this issue from two distinct angles; (1) addressing challenges of multiple, overlapping regulatory jurisdictions through collaboration and coordination of efforts and (2) pursuing opportunities to leverage existing local planning efforts and combining implementation programs and projects to gain economy of scale.

Goals:

- Limit duplication of planning and implementation efforts by the District and its State and Local partners by improving collaboration and coordination of efforts.
- Create efficiencies in implementation through partnerships

Implementation Indicators:

- Collaborate and coordinate agency efforts through engagement of a standing Technical Advisory Committee;
- Incorporate local input into District planning efforts through engagement of a standing Citizens Advisory Committee
- Inform State and Regional agencies and organizations of local efforts through participation in their advisory committees;
- Combine local implementation to gain economy of scale;
- Incorporate implementation actions identified in regional planning efforts into District programs.

Implementation Tool: Assessment and Planning, Education

Additional Information:

http://www.swwdmn.org/wp-content/uploads/2016/03/

Locally-Driven-Watershed-Restoration.pdf

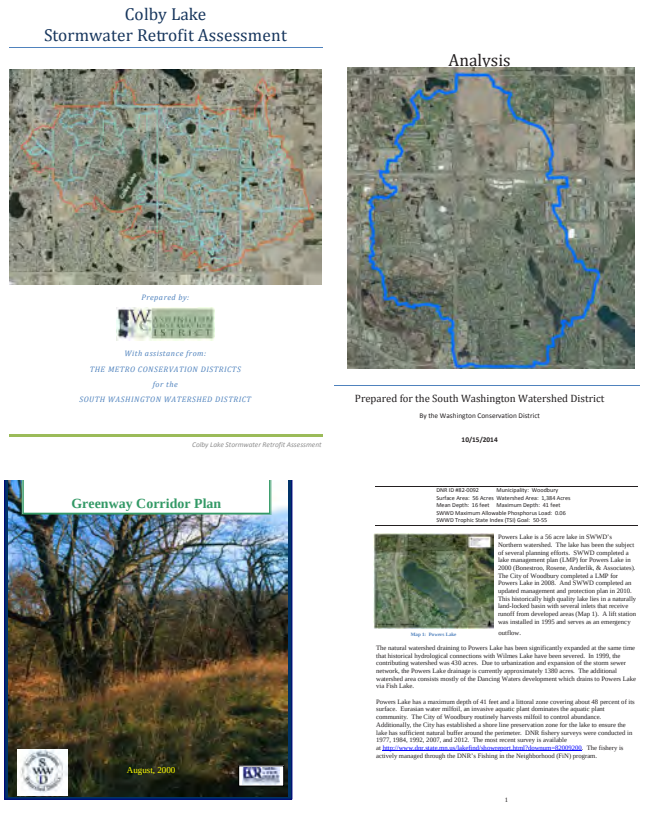
PART III: IMPLEMENTATION

PROGRAMS

Several Watershed District programs are specifically required under MN Rule 8410 and the District's Municipal Separate Storm Sewer System (MS4) permit. While the District takes seriously its general roles and responsibilities it tailors those programs to first address priority issues identified through the aforementioned public process. The following programs reflect that commitment and are intended to establish the programmatic framework to facilitate a community response to issues currently identified in this plan and others that emerge during the course of implementation. That focus is reflected in the District's mission statement

-SWWD mission statement -

To manage water and related resources of the District in cooperation with our citizens and communities.



Example Watershed Plan Guidance Documents

PROGRAM: PLANNING

Adaptive Management is an iterative, systematic process for continually improving management strategies and practices by learning from the outcomes of previously employed actions. SWWD is committed to using an adaptive management approach to watershed management as a means to managing uncertainty. The use of an iterative decision making process enables the District to work toward its goals while maximizing information gathering to better inform future efforts. This approach is highly valuable in that it facilitates District action despite varying levels of uncertainty that is characteristic of environmental systems. With additional information, strategies and practices are modified as necessary to best manage the watershed. Through its various planning efforts, SWWD evaluates resource issues, risks, and uncertainty in formulating a strategy or identifying practices to address identified issues. The District routinely collects information to evaluate success of implemented practices and better inform understanding of resource issues. Using that information, the District re-visits planning efforts to revise strategies as necessary.

PURPOSE: TO PROVIDE CURRENT, SOUND GUIDANCE FOR IMPLEMENTATION

Additionally, several new District-led planning efforts are planned over the life of this Plan to address identified issues related to water quality, flooding, climate change, and natural resources. The scope and purpose of those plans are briefly described below. Participation in non District-led planning efforts are also identified under Program Performance Measures. Those efforts include areas the District has stated concern but that are best addressed at a larger scale (e.g. groundwater).

RESOURCE MANAGEMENT PLANS

The District has completed resource management plans for several of its lakes and streams. Plans will be completed for all remaining resources within 6 years of adoption of this WMP. All completed resource management plans will be evaluated at a minimum of every 3 years. The purpose of the District's resource management plans are to identify improvements and actions necessary to achieve the District's resource goals. Generally, the plans include extensive watershed and in-lake modeling with subsequent cost/benefit analysis of potential practices and actions.

FLOOD DAMAGE REDUCTION & MITIGATION PLAN

SWWD has historically assisted City led efforts in responding to flooding issues within the District (i.e. Wilmes Lake, Newport). Those efforts will continue with a primary focus on communities bordering the Mississippi River. These communities are vulnerable to ever increasing flood levels and aging infrastructure. The purpose of the flood damage reduction and mitigation plan is to identify vulnerable communities and establish District tools to reduce or mitigate flood damage.

CLIMATE ADAPTATION PLAN

Impacts of climate change on District resources and infrastructure was identified as a priority issue during development of this Watershed Management Plan. While extensive work continues at scales much larger than the District to predict how climate will continue to change and identify potential impacts, work remains to downscale that work to develop actionable strategies for the District. No later than 2022, the District will complete a Climate Adaptation Plan to guide District efforts to increase resiliency of District resources and infrastructure. This planning effort will include scenario modeling to identify impacts from predicted increases in extreme temperature and precipitation events.

NATURAL RESOURCES

The District has long had programs in place to facilitate natural resource protection and restoration. However, implementation has been slow due, in part, to non-existent or outdated plans and limited coordination with Cities. To improve and guide implementation, SWWD intends to persue several natural resource planning efforts during the life of this WMP. Highest priority items include revisions to the District's existing greenway plan, completion of a ravine survey and assessment, and update of hte District's

PROGRAM: PLANNING

Wetland inventory. Subsequent planning efforts will include evaluation of aquatic habitat of District resources and in-lake restoration plans.

The District's existing Greenway Plan was completed in 2000. While that plan remains valuable, it was completed prior to expansion of the District. Revision of the plan will expand existing identified corridors to the full District in cooperation with Cities and Washington County parks. The planning effort will also include substantial coordination with Cities and Washington County to identify approaches to establishing and protecting identified corridors.

Prior watershed inventory and modeling work has shown that ravine erosion (as opposed to bed or bank erosion) is a significant contributor to known sediment and nutrient levels in the District's water resources. Response to stabilize ravines is well established and relatively inexpensive. However, to date, there is little planning completed to guide that response. In partnership with MnDNR and Washington Conservation District, SWWD will complete a ravine inventory, rank the inventoried ravines based on erosion potential and downstream impact, and document standard stabilization practices to be used. Focus of this planning effort will be watersheds drained by natural streams and those with direct drainage to the Mississippi and St. Croix Rivers. Ravines in SWWD's lake watersheds will be assessed as part of Lake management planning.

SWWD completed a wetland inventory and management plan prior to exanding into the East Mississippi and Lower St. Croix management units. That inventory requires update to include changes over the past decade and areas now within SWWD jurisdiction.

Several of SWWD's completed lake management plans call for reductions of in-lake nutrient loading. To facilitate those reductions, SWWD intends to implement more extensive in-lake restoration efforts to improve aquatic habitat and foster more balanced fish and plant communities. SWWD will complete an aquatic habitat restoration plan to establish implementation tools to address in-lake deficiencies.

GUIDANCE DOCUMENTS

All completed plans will be adopted as Guidance Documents to this Watershed Management Plan. In a process established under its 2007 WMP, SWWD uses Guidance Documents to respond to new and changing information. Guidance documents are expected to provide significant assistance towards addressing an issue or topic and must meet the following criteria to be considered for adoption as a guidance document.

- The product should have a direct relationship with the WMP content. The relationship may be identified as an overlap with issues, policies/actions, programs, or more broadly, a management area. Included are plans which further direct already identified funds toward cost effective implementation.
- The product should follow due diligence during development to include some form of input and/or review by one or more member cities, and public input process. This will depend on the level of technical content within the product, with which the public may not be familiar. Due diligence may take the form of a District initieated Technical Advisory Committee and review by the district's standing Citizen Advisory Committee.
- The product content should provide adequate specificity in describing desired processes, outcomes or recommendations so that implications of the proposed Guidance Document are clear to the Board and others.

Any products proposed as Guidance Documents must be formally accepted by the SWWD Board at a regularly scheduled meeting. When requesting acceptance by the Board, the SWWD Administrator will make the Board aware that the product is intended to serve as a Guidance Document, and demonstrate conformance with the established criteria. Similarly, updates or adjustments to adopted Guidance Documents are anticipated to have Board acceptance.

Capital improvement projects proposed in a Guidance Document and, if necessary, approved as a WMP amendment, shall be programmed into the Annual Work Plan and Budget for implementation. The SWWD Board shall determine the priority of any proposed projects based on data specific to the issue provided in the Guidance Document, and the priorities of the WMP.

All guidance documents are available in the SWWD electronic library at www.swwdmn.org. Known stakeholders

PROGRAM: PLANNING

will receive formal written notice (electronic or mailed) regarding updates or availability of new materials.

AMENDMENTS TO THIS PLAN

Consistent with MN Rule 8410, this plan extends 10 years from the Date of adoption, or amendment. However, as previously described, this plan is intended to serve SWWD for decades to come with regular amendment. We do not expect Part I to require regular amendment. Part II includes identified issues and goals and serves as the basis for all actions that the District takes. At a minimum, issues and goals will be evaluated every 5 years. Results of that evaluation will be incorporated into this plan by amendment, as necessary. Part III serves as the District's implementation plan, establishing District programs, Long Range Workplan, and Administrative procedures. Effectiveness of implementation actions identified under Part III will be evaluated at a minimum of every two years. It is the District's intention that Part III of the plan will be regularly updated to reflect the District's planning work.

Amendments will not be required for the following:

- Formatting or reorganization of the plan
- Revision of procedures meant to streamline administration of the plan
- Clarification of existing plan goals or policies
- Inclusion of additional data not requiring interpretation, including incorporation of new or updated Guidance Documents
- Updated costs estimates incorporated into the long range workplan
- Additions or deletions of activities/studies to/from the long range workplan resulting from the District's annual budgeting process
- Expansion of public process
- Adjustments to how SWWD carries out program activities within its discretion

Should the plan be modified without amendment, the District will distribute notice of the changes to all past recipients of the District's plan within 30 days of adoption. Upon adoption, SWWD will post the current version on its website along with a strikeout/underline version which will be posted for a minimum of 60 days. Hard copies of the revised plan will be distributed upon request.

Changes requiring amendment will follow amendment procedures as specified in MN Statute 103B.231, subd. 11 and MN Rule 8410. Completion of any amendment will include public involvement through the District's Citizen and Technical Advisory Committees. That involvement will include review of the entire plan to ensure that it still meets the needs of the District. Upon adoption, The District will distribute notice of the changes to all past recipients of the District's plan within 30 days of adoption. SWWD will post the current version on its website along with a strikeout/underline version which will be posted for a minimum of 60 days. Hard copies of the revised plan will be distributed upon request. Upon adoption of an amendment which was subjected to 60 and 90 day agency review, the amended plan will be valid for 10 years from date of adoption.

ADVISORY COMMITTEES

SWWD utilizes two separate advisory committees to inform its planning efforts—a Citizens Advisory Committee (CAC), and an Ad Hoc Technical Advisory Committee (TAC). Analogous to a municipal planning commission, the CAC is a standing committee appointed by the SWWD Board to assist the District in executing planning efforts, developing implementation programs, evaluating District implementation progress, and serving as a link between the District and its Cities and Townships. SWWD attempts to maintain a CAC membership consisting of at least one member from each City and Township in the District and members covering a broad range of viewpoints including agriculture, sportsman's organizations, and local governments (SWCD, Cities). CAC members are appointed to 3 year terms. There is no limit on number of terms. CAC members are responsible for electing its officers.

The District TAC is formed to provide technical expertise to specific planning and project development efforts and to

PROGRAM: PLANNING

ensure that District efforts are consistent with other local and state efforts. TAC composition varies by purpose, but typically consists of local and state agency staff. The TAC is formed through invitation of District staff and meets as necessary for the completion of its intended purpose.

Performance Measures:

- Up to date planning documents necessary to guide District Implementation
- Update key flood storage inventory within 3 years;
- Complete SWWD Flooding Emergency Response Plan within 6 years;
- Review and update inter-community flow limits within 3 years;
- Complete resource management plans for all lakes and perennial open channel streams within the District within 6 years;
- Re-assess completed management plans at a minimum of once every 3 years to evaluate progress and review and adjust strategies;
- ID excessively eroding bluff ravines within 3 years;
- Identify areas with high priority for protection or potential for restoration within 6 years and incorporate into District Greenway development where feasible;
- Utilize District models and predicted, extreme hydrologic scenarios to identify infrastructure vulnerabilities—degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change—within 5 years;
- Participate in State or Regional planning efforts to coordinate groundwater resource assessment and regulation.
- Update and finalize the Districts Wetland inventory.

PROGRAM: REGULATORY

Land alteration can affect the rate, volume, and quality of surface runoff and lead to degradation of District resources through several mechanisms. Sedimentation in lakes and streams from on-going erosion processes and construction activities reduces the hydraulic capacity of water bodies and degrades water quality. Projects which increase the rate of stormwater runoff or degrade runoff quality increase the need for storage and can aggravate existing water quality problems and contribute to new ones. Projects which fill floodplain or wetland areas can increase the need for storage by reducing stormwater storage and hydraulic capacity of water bodies and degrade water quality by eliminating the filtering capacity of such areas.

PURPOSE: TO LIMIT THE AFFECTS OF LAND ALTERATIONS AND PROTECT THE PUBLIC HEALTH, WELFARE, AND NATURAL RESOURCES OF THE DISTRICT

Established under authoities granted in MN Statute 103D, District Rules seek to limit the affects land alterations to protect the public health, welfare, and natural resources of the District, reduce the need for additional storage capacity and the potential need for the construction of systems to convey storm water, preserve floodplains and wetland storage capacity, maintain or improve the chemical and physical quality of the surface and groundwater, reduce sedimentation, preserve the hydraulic and navigational capacity of water bodies, preserve natural shoreland features, and minimize the public expenditure to avoid or correct such problems in the future. Absent from the District's current rules is any regulatory mechanism related to enforcement of the State's new buffer requirements. Once SWWD's responsbiliites become clear the District will amend its rules and this Plan as necessary to ensure the District's responsibilities are met and there is an effective and efficient local mechanism to establish and maintain required buffers on Public Waters.

Erosion Control Workshop

Primary responsibility for management of water quality and stormwater runoff lies with the District. However, the District recognizes that the primary control and determination of appropriate land uses is the responsibility of its municipalities. Accordingly, the District will coordinate development permit application reviews with the municipality where the property is located. The District urges municipalities to develop, as rapidly as possible, a LWMP, providing a coordinated system of managing surface water on a regional or subwatershed basis consistent with District Rules. Where such a municipal plan is adopted, the requirements of the District's Rules which are met by the municipal plan shall be deemed satisfied upon issuance of an appropriate municipal permit. In the absence of a LWMP on a municipal or subwatershed level, or where required by a Municipal LWMP, SWWD will continue to require individual site-by-site SWWD permits for projects involving land alteration.

In addition to establishing and enforcing rules, the District serves as the responsible Local Government Unit for administration of the State of Minnesota's Wetland Conservation Act in all portions of the District except the Cities of Oakdale and Hastings.

Performance Measures:

- Compliance with District and Municipal Controls. Where the District issues permits, compliance with be evaluated and enforced through the District's permit review and construction inspection procedures. Where the District has deferred to Municipal review and permitting, compliance will be

PROGRAM: REGULATORY

evaluated through routine audit of Municipal review, permitting, and construction inspection procedures as related to specific projects. The performance measure goal is 100% compliance with District and Municipal controls.

- Ensure full coverage of State NPDES program requirements across District and limit duplication of effort through coordination with Cities and local agencies. To be reviewed annually as part of MS4 reporting.

- Effectively administer the Wetland Conservation Act to meet the State and SWWD goal of no net loss of wetland acres. To be reviewed annually as part of Wetland Conservation Act LGU reporting.

- Ensure District compliance with State buffer requirements.

Additional Information:

http://www.swwdmn.org/wp-content/

uploads/2016/03/2015SWWDRules.pdf

http://www.bwsr.state.mn.us/wetlands/wca/

http://www.pca.state.mn.us/index.php/water/water-types-and-programs/stormwater/municipal-stormwater/municipal-separate-storm-sewer-systems-ms4.html

http://www.dnr.state.mn.us/buffers/index.html

PROGRAM: IMPLEMENTATION AND MAINTENANCE

MONITORING

SWWD has operated a surface water quality and quantity monitoring program since 1996. SWWD's past Watershed Management Plan and current Monitoring Plan established a framework for characterizing and managing water resources at a regional level. To optimize monitoring efforts for regional assessment, the District has designated key locations at critical crossings and checkpoints throughout the watershed as regional assessment locations (Chapter 6, Section 8 of the SWWD 2007 WMP, Houston Engineering). Locations were chosen to characterize water quality and quantity entering or leaving a region and are included on the District's web viewer. Data collected at these locations is used to identify trends in regional water quality and quantity as well as potential areas for concern, develop and verify regional models, set benchmarks for regional water quality, evaluate effectiveness of District Rules and evaluate regional effects of proposed development projects. Once established, all regional assessment locations are part of the District's permanent monitoring program and will be operated until deemed unnecessary by analysis and modeling.

PURPOSE: TO PROVIDE THE MECHANISM AND RESOURCES TO REVERSE OR ADAPT TO THE IMPACTS OF LAND ALTERATION AND CLIMATE CHANGE

To enhance the SWWD regional assessment framework, the District operates subwatershed assessment sites on a rotating basis. Subwatershed assessment locations are chosen in order to further define and manage water resources within the major regions of the watershed. Data collected at these locations will be used to identify priority subwatersheds within the larger watershed regions of the District as well as to help calibrate regional models and update maximum allowable load levels corresponding to the contributing areas for each location. Subwatershed assessment sites, once established, are typically operated for a period of 3-10 years depending on District goals and value of the data being collected. All past and current Subwatershed assessment locations are included on the District's web viewer.

The SWWD utilizes two approaches for monitoring of waterbodies throughout the District. First, the District conducts long-term, screening level water quality monitoring of lakes through participation in the Metropolitan Council Citizen-Assisted Lake Monitoring Program (CAMP). By collecting long-term, baseline data for area Lakes, the District can identify trends—both positive and negative—and identify targets for in-depth study. Second, the District undertakes in-depth, assessment level monitoring of priority waterbodies, impaired waters, and others targeted for in-depth study.

In-depth assessment of individual waterbodies becomes necessary when data from screening level monitoring programs indicates impairment or nutrient loading in excess of SWWD or MN standards. Assessments will generally last 3-5 years and consist of CAMP monitoring, and a network of automated water quality and quantity monitoring sites at the waterbody's inlets. Automated stations will be operated using the same equipment and procedures used for regional assessment monitoring locations. Data will be used to identify portions of the watershed leading to the impairment or nutrient loading. After subwatershed loading is characterized and mitigation actions taken, CAMP monitoring will continue and automated monitoring sites will be rotated amongst the lake's inlets so that each is monitored at least once every five years. Inlets will be monitored more frequently if poor water quality or high year to year variability in data persists.

Much of the property in the South Washington watershed is relatively newly developed. As they were built, those developments were subject to runoff peak, runoff volume, and phosphorous loading standards. Developments utilize a variety of stormwater features and BMPs to meet those standards. However, the success of those stormwater features and BMPs at meeting SWWD standards is largely unknown. SWWD will initiate assessments to examine the flow and nutrient reduction capacities of various BMPs. Data will be used to assess reduction in flow rate and volume and phosphorous as well as to better inform engineers and designers of the success of various features and BMPs in south Washington County.

Municipalities within the SWWD rely on groundwater

PROGRAM: IMPLEMENTATION AND MAINTENANCE

MONITORING (CONTINUED)

to provide potable water, satisfy water demand for commercial and industrial facilities, and irrigation. Additionally, many surface water features have direct interaction with groundwater. Therefore, management of some surface water resources is also dependent on high quality, sustainable levels of groundwater.

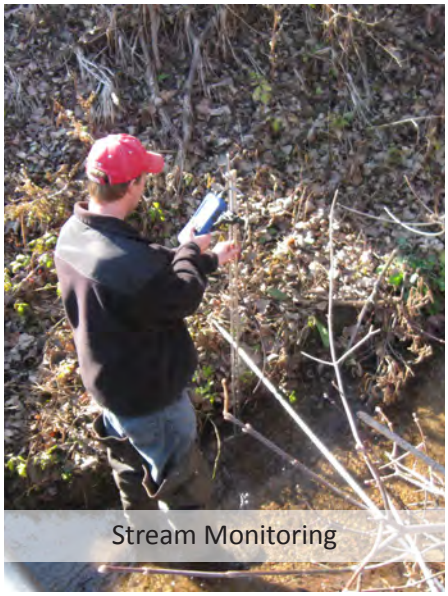
Multiple examinations of groundwater resources have been completed in south Washington County. The extensive, multi-phase Infiltration Management Study (EOR, 2001) was initiated by SWWD in 1997 in order to examine the use of infiltration in stormwater management. The study reported that the utilization of "the natural features of this watershed, such as extensive natural detention areas and high infiltration capacities, is a sound and innovative approach to stormwater management that is foresighted and directed toward the future of more natural, less costly solutions." Additional work by Barr Engineering (2005a and 2005b) led to completion of a groundwater flow model and characterization of infiltration potential throughout the District, noting that the majority of the area served as a recharge area. The SWWD has made it common practice to mitigate for groundwater withdrawals and lost natural groundwater recharge rates by routing water from impervious areas to open areas or infiltration basins. However, the District is also aware that the need to replenish the aquifers must be balanced with the need to prevent potentially degraded water from impacting groundwater quality.

The Cottage Grove Area Nitrate Study (Barr, 2003) found elevated nitrate concentrations in wells throughout the Cottage Grove area. Further, many of those wells were within one mile of a bedrock fault. Investigators concluded that the fault is associated with enhanced recharge through rapid downward percolation of water. Similar faults are located in bedrock throughout south Washington County. The Minnesota Department of Agriculture continues Nitrate monitoring assessment throughout SWWD.

A literature review conducted for the MPCA (Weiss et al. 2008) indicated mixed results when examining groundwater contamination from infiltrated stormwater. Contamination risk is higher for salts and pathogens, while it is generally lower for other pollutants. However, contamination risk largely depends on soil and geologic characteristics. A major consideration is the presence of karst features that can provide rapid and direct conveyance of stormwater to groundwater.

Currently, the District operates a groundwater level monitoring network and is transitioning to a regional assessment program. The focus of that program to detect effects of stormwater infiltration as the watershed continues to develop. With its partners, SWWD will evaluate the need and feasibility of identifying and monitoring regional groundwater assessment locations throughout the District.

If and when program guidelines are fully established, SWWD will work with MDH and/or a Technical Advisory Committee to identify new sites for expansion of the program leveraging existing groundwater models to optimize placement and existing wells where possible to minimize cost. As part of the process, SWWD will work with partners to refine existing models using SWWD data. All new regional assessment sites will be equipped with automated water level loggers. Existing sites will retrofitted with automated water level loggers as necessary. Data from the regional assessment network will be used to identify trends, assess the sustainability of groundwater resources, and refine and calibrate the South Washington groundwater model (Barr Engineering).


Stream Monitoring

SWWD will investigate trends of degrading groundwater quality or increased fluctuation of groundwater levels using groundwater models developed for south Washington County to target likely causes. The SWWD will then undertake in-field, in-depth assessment to verify sources and target mitigation strategies.

Performance Measures:

- Survey aquatic vegetation of District Lakes a minimum of every 3 years;
- Annually implement District's monitoring plan;
- Monitor levels and water quality of all publically accessible lakes annually;
- Monitor established Regional Assessment Locations a minimum of 3 out of every 6 years;
- Complete a Strategic Groundwater Assessment Plan In cooperation with Municipalities, MnDNR, MDH, MPCA, and others to identify gaps in aquifer level monitoring network within the District within 3 years and Identify existing wells or install new wells necessary to fill identified monitoring gaps.

Additional Information:

http://www.swwdmn.org/programs/monitoring-program/

http://www.mnwcd.org/water-quality-water-monitoring/

http://www.mda.state.mn.us/townshiptesting

PROGRAM: IMPLEMENTATION AND MAINTENANCE

WATERSHED RESTORATION, RECONSTRUCTION, AND RESILIENCY

Several of the priority issues facing the District are caused by changes both inside and outside of the District including landuse conversion and climate change. The District's Watershed Restoration, Reconstruction, and Resiliency program provides implementation funds to address problems that these changes cause including altered hydrographs or increase in peak flows as water runs off of the watershed more quickly, stabilization of natural drainage systems to withstand anticipated discharges, protection and restoration of rare and native communities, increasing resiliency of natural and man-made systems against climate changes, reducing habitat fragmentation by creating or maintaining linear corridors, managing invasive species, and protecting groundwater resources.

PURPOSE: TO PROVIDE THE MECHANISM AND RESOURCES TO REVERSE OR ADAPT TO THE IMPACTS OF LAND ALTERATION AND CLIMATE CHANGE

All implementation under this program will be guided by existing or future guidance documents. Existing guidance documents include the District's Greenway Corridor Plan, Resource Management Plans, and County Groundwater Plan. Future documents will focus on climate adaptation and resiliency, Agriculture BMP Pilot Program, and natural resources. Funding for implementation under this program is provided for through collection of Stormwater Utility Fees and Levy funds.

Typical Raingarden Installation

SWWD's 1997 Watershed Management Plan and 2000 Greenway Corridor Plan identified the need for a greenway corridor encompassing the major North/South drainage route through the center of the District. As originally conceived the greenway would link Lake Elmo Regional Park with Cottage Grove Ravine Regional Park and the Mississippi River and provide a link to the proposed park on Grey Cloud Island to the West. A major purpose of that plan was to identify missing links in the corridors. To date, SWWD efforts have focused on securing those missing links. That effort has resulted in a nearly complete corridor covering the North/South Drainage. That corridor will be permanently protected with development of Cottage Grove's East Ravine watershed. Future planning efforts will expand the greenway plan to include additional linkages in the District's East Mississippi and Lower St. Croix management areas. The goal of the original plan remains: to create a multipurpose system of open space that provides a physical link to existing natural areas while providing for conveyance of stormwater runoff. The linear system provided by a greenway provides cost effective overland routes for stormwater, maintains natural stream systems, and provides important community amenities including active and passive recreation, fish and wildlife habitat, rare species habitat, groundwater recharge, water quality protection, environmental education, and erosion control.

District resource management plans are developed to identify the source of a resource problem and identify cost-effective practices to address it. Typical scenarios may include excess nutrient loading to a lake caused by development in the watershed or destabilized stream channels caused by drain tiling or other changes in farming practices. Typically, most cost effective solutions are focused on source control and heavily rely on various infiltration practices to keep water and nutrients on the land and help recreate a more natural hydrograph.


Rear Yard Vegetated Swale

Performance Measures:

- Establishment and protection of identified greenway corridors (Greenway Plan);
- Establishment and protection of vegetated buffers along streams, ravines, bluffs and around lakes and wetlands (Buffers, Part II);
- Stabilization of identified ravines to prevent downstream transport of sediment and nutrients (Bluff erosion, Part II);
- Implementation of yet to be identified practices to increase resiliency of natural and man-made systems against land use and climate change (Climate Change, Part II);
- Implementation of regionally identified strategies to address aquatic and terrestrial invasive species.
- Identify willing landowners and begin operation of pilot agriculture BMP research program within 6 years;
- Provide adequate funding for local implementation actions identified in the Washington County Groundwater Plan.

Additional Information:

http://www.swwdmn.org/wp-content/uploads/2016/03/Washington-County-Groundwater-Plan.pdf

http://www.swwdmn.org/wp-content/uploads/2016/03/SWWD-Greenway-Corridor-Plan-2000.pdf

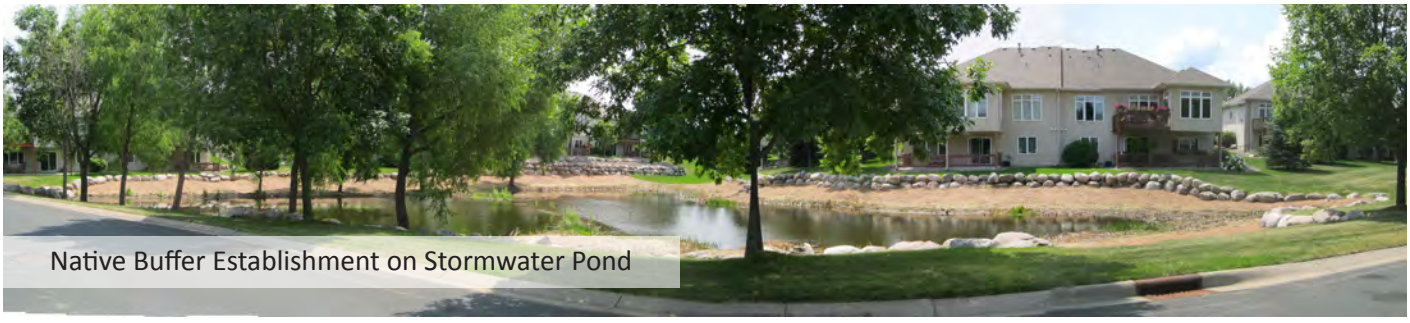
http://www.swwdmn.org/wp-content/uploads/2016/03/DRAFT_Wetland_Mgmt_Plan_2002_SWWDVERSION-1.pdf

http://www.swwdmn.org/wp-content/uploads/2016/03/Grey-Cloud-Slough-Feasibility-Report-Final-1.pdf

MDA Pollinators http://www.mda.state.mn.us/protecting/bmps/pollinators.aspx

MDA Irrigation http://www.mda.state.mn.us/protecting/conservation/practices/irrigation.aspx


Trout Brook Streambank Stabilization


Native Buffer Establishment on Stormwater Pond

PROGRAM: IMPLEMENTATION AND MAINTENANCE

INSPECTION AND MAINTENANCE

The District and its partners utilize an increasingly long list of BMPs to meet local resource goals. Physical BMPs need routine inspection and maintenance to ensure long term functionality. The majority of the District is covered by various MS4 permittees. Responsibility for inspection and maintenance lies with the LGU which owns and operates the system/BMP except where other arrangements have been made through agreement. Through the Washington County Water Consortium, SWWD and its local partners have developed a BMP database and have begun an annual inspection program. Through that effort, SWWD tracks performance and maintenance needs of District BMPs. Necessary maintenance will be addressed through enforcement of agreements/permits or as part of the District's annual operation and maintenance program.

PURPOSE: TO HELP ENSURE CONTINUED EFFECTIVENESS OF CONSTRUCTED BEST MANAGEMENT PRACTICES

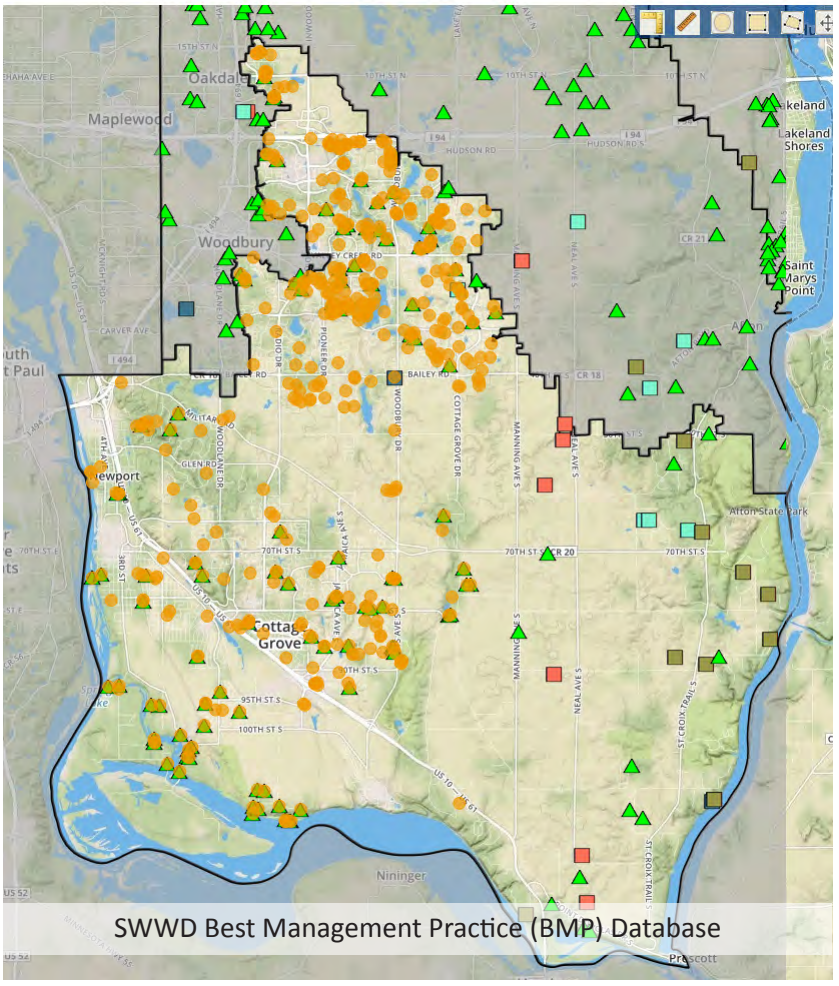
Natural streams in the District have been inspected as part of previous natural resource inventories to identify active erosion. Those streams will be revisited during development of the District's ravine inventory plan.

Performance Measures:

- Maintain database of all physical BMPs;
- Inspect BMPs at a minimum of 10, 33, and 66% of expected BMP lifetime;
- Perform maintenance or enforce maintenance agreements as necessary to maintain full resource benefits of BMPs.

Additional Information:

http://map.swwdmn.org/
(Select 'Water' then select 'Best Management Practices')



SWWD Best Management Practice (BMP) Database

PROGRAM: IMPLEMENTATION AND MAINTENANCE

CAPITAL IMPROVEMENT

Consistent with MN Rule 8410, SWWD defines Capital Improvement Project (CIP) as a physical improvement with an extended useful life. For the purposes of its CIP Program, the District further defines a CIP as having a lifetime of greater than 25 years and a total project cost greater than $50,000. Generally, projects to implemented under the District's CIP are developed and analyzed through completion of a feasibility study. Projects not meeting CIP program criteria are typically implemented through the District's Watershed Restoration, Reconstruction, and Resiliency program. The CIP plan is included as part of the District's long range workplan and includes all CIP projects the District intends to implement between 2017 and 2026. The plan is reviewed biennially and amendments, if necessary, are carried out under State guidelines for general watershed plan amendments.

PURPOSE: TO PROVIDE A MECHANISM TO PLAN FOR AND FUND NECESSARY PHYSICAL IMPROVEMENTS

Performance Measures:

- Provide adequate funding to carryout identified capital projects
- Deliver Capital improvements as scheduled in the long-range workplan

Stormwater Reuse Intake Pipe Installation

Additional Information:

http://www.swwdmn.org/wp-content/uploads/2016/04/2013_BoDR_100913.pdf

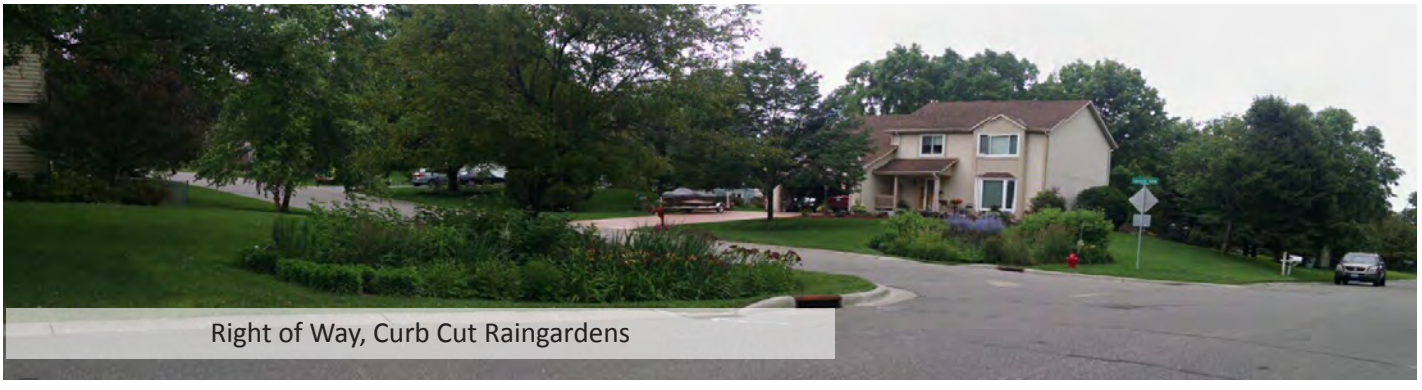
Central Draw Storage Facility and Overflow

Trout Brook Restoration

Newport Ravine Stabilization

Colby Lake Neighborhood Raingardens

http://www.swwdmn.org/wp-content/uploads/2016/03/Grey-Cloud-Slough-Feasibility-Report-Final-1.pdf



Right of Way, Curb Cut Raingardens

PROGRAM: IMPLEMENTATION AND MAINTENANCE

INCENTIVES

Implementation need outpaces the District's implementation capacity. To address that need and gain efficiency by drawing on the capacity of public and private entities in the District, SWWD operates several incentive programs to facilitate implementation by District residents and partners. Those programs are briefly described here. Additional information is available on the SWWD website.

PURPOSE: TO LEVERAGE IMPLEMENTATION CAPACITY OF PUBLIC AND PRIVATE LANDOWNERS OF THE DISTRICT TO FACILITATE RESOURCE PROTECTION AND RESTORATION

GROUNDWATER POLLUTION PREVENTION

Washington County offers several grant or loan programs to incentivize residential protection of groundwater resources (i.e. well sealing, septic system upgrades). The District does not currently offer similar programs. However, it may supplement existing County efforts through its Watershed Restoration, Reconstruction, and Resiliency Program. Should the District identify a need to implement its own groundwater focused incentive program, this Plan will be amended as necessary.

East Ridge Regional Pond

COST SHARE

The SWWD Clean Water Cost Share Program offers financial assistance to encourage and enable citizens, municipalities, and businesses to use innovative practices to protect and improve lakes and streams within the district. This program promotes water quality improvement by focusing on the reduction of phosphorus in stormwater runoff. Design assistance is available through SWWD and its partners. Program details and eligibility criteria are established annually by the SWWD Board of Managers following its budgeting process. Current program information is available at http://www.swwdmn.org/programs/water-quality-cost-share-program/. A map based database of projects funded through the program is available at https://www.mapfeeder.net/wcdbmp/.

STORMWATER UTILITY FEE CREDITS

The SWWD has set standards for controlling the amount of stormwater runoff volume for new development projects. In addition to this standard, the SWWD supports voluntary efforts to reduce the stormwater runoff volumes leaving a property. By providing a framework to reduce the stormwater utility fee (SUF) for a property based on volume control BMPs, the SWWD provides financial incentive for voluntary efforts to reduce stormwater runoff. SWWD offers SUF credits for BMP retrofitting that reduces annual runoff volume. Likewise, credits are available to new and re-development projects that go beyond current SWWD volume control standards. Current SUF credit program information is available at www.swwdmn.org.

COORDINATED CAPITAL IMPROVEMENTS

To facilitate actions to improve stormwater management in existing developed areas, the District administers a Coordinated Capital Improvement Program (CCIP) to provide financial assistance to local land use and public works authorities for water quality improvement projects. The goals of the program are to:

PROGRAM: IMPLEMENTATION AND MAINTENANCE

- Facilitate local government units within the District to explore water quality improvement opportunities and incorporate those opportunities into routine infrastructure operation and maintenance projects;
- Promote closer collaboration between local units and the District on water quality improvement efforts as an element of capital improvement plans;
- Foster stormwater management innovation and create demonstration/ education examples;
- Defray local costs in the broader, watershed-wide interest of improving water quality; and
- Improve de-icing operations throughout the District.

Stabilized Ravine at Wilmes Lake

Each year, the Board will set a budget for the following year's program pursuant to the Board's assessment of needs and funding limitations, not to exceed $1,000,000 per year. This is an open process that occurs in August and early September each year, and includes a public hearing at which all parties can review and address the Board of Managers on the District's proposed program budget.

Stormwater quality improvements made under the CCIP are more local in nature; however, cumulatively these projects will benefit the watershed as a whole. As improvements are more local, the CCIP program is funded through the collection of stormwater utility fees. Ad valorem levies will not be used to fund the CCIP. Other funding sources such as regional, state or federal grants may be applied to the program if the District is successfully awarded such grants for this purpose. Additional information about the CCIP program including current guidelines and most recent Request for Proposals is available at www.swwdmn.org.

Performance Measures:

- Maintain and refine existing incentive programs to adequately leverage community interest;
- Develop Incentive program focused on BMP implementation on agricultural lands within 3 years;
- Annually review District's role in and need for supplementing County groundwater focused cost share and loan programs.

Additional Information:

http://www.swwdmn.org/programs/water-quality-cost-share-program/

http://www.swwdmn.org/programs/coordinated-capital-improvement-program-ccip/

https://www.co.washington.mn.us/index.aspx?NID=636

Native Planting at Newport Overlook

PROGRAM: EDUCATION AND INFORMATION

Education: SWWD is a member of the East Metro Water Resource Education Program. EMWREP is a partnership formed in 2006 that serves 20 local units of government

PURPOSE: TO EFFICIENTLY INFORM AND EDUCATE DISTRICT RESIDENTS AND STAKEHOLDERS

in the east metro area. The purpose of the shared education program is to provide education to District communities and their residents about the impacts of non-point source pollution (e.g. nutrients, de-icing chemicals) on local lakes, rivers, streams, wetlands and groundwater resources and to engage them in projects that will help to protect and improve water quality in the region. In 2012, the Minnesota Association of Watershed Districts recognized EMWREP as its Program of the Year.

Most District education efforts are implemented through EMWREP programming. Additional, smaller efforts are occasionally undertaken directly by SWWD staff. All education programing is funded through District levy funds.

EMWREP Workshop

Information: SWWD intends for this plan and its website to serve as a repository of water resource related information relevant to resources of the District. As such, we have incorporated known, relevant references into this plan with live links to the website or document and will amend the plan to include new references as they are developed or identified. Additionally, the District's website includes several tools which serve to deliver information to District residents and stakeholders including:

- Electronic Library: This resource houses all District resources, including meeting agendas and minutes, guidance documents, lake management plans, monitoring reports, annual reports, etc.

EMWREP Promotional Material

- Water Quality Monitoring Database: This resource holds all of the District's surface water quality monitoring data and provides basic graphical and statistical functions. It also serves a portal to download District water quality data.
- Web Viewer: This resource houses basic District geographical data and provides several basic mapping and ID functions.
- Story Maps: These resources provide additional information about District projects including photos and interactive maps.

Finally, in an effort to standardize the methods and procedures for evaluating hydrological impacts from

PROGRAM: EDUCATION AND INFORMATION

development and land use changes, SWWD has established standard hydrological modeling specifications and is developing XPSWMM hydrological models covering the entire District. The models and specifications are available in the District's modeling library upon request.

Performance Measures:

- Continue support of and participation in EMWREP;
- Increase use of Website and Web Tools;
- Annually update story mapping as part of annual report to reflect current project status;
- Annually update water quality database to include previous year's data;
- Annually update web viewer to reflect most recent spatial data;
- Distribute semi-annual newsletter to District residents and stakeholders regarding District efforts and progress in addressing identified resource issues.
- Maintain up to date files on electronic library;
- Establish standard modelling specifications within 3 years;
- Annually update completed models to reflect changing conditions;

Additional Information:

http://www.mnwcd.org/emwrep/

http://www.swwdmn.org/resources/

http://map.swwdmn.org/

http://wq.swwdmn.org/

http://www.swwdmn.org/projects/

PROGRAM: ADMINISTRATION

BOUNDARY

The current legal boundary of the SWWD is shown on Figure 1 and is available on the SWWD web viewer. Procedures for adjusting the legal boundary were established with the consolidation of the SWWD and the East Mississippi Watershed Management Organization. Legal descriptions of watershed boundaries are cumbersome to develop and adjust. Instead, the SWWD uses geospatial data established within Geographic Information System (GIS) to convey the legal boundary. Washington County upholds this established process for adjusting watershed legal boundaries. The SWWD annually reviews parcel data to verify existing properties and identify any necessary boundary change. Necessary changes are made through petition to BWSR.

At times projects are proposed or issues occur within the legal boundary of the SWWD, but are outside of the hydrologic drainage area. These projects are approached on a case-by-case basis. Typically, the SWWD will assume the lead role on projects or issues which are within the legal boundary. Generally, the SWWD will coordinate with the appropriate adjacent watershed entity to ensure effective administration and project oversight.

FUNDING

SWWD collects revenue through three primary sources authorized under MN Statues 103b and 103d—ad valorem levy and water management district fees or stormwater utility fees. SWWD does collect fees for permit reviews; however those fees are limited and used only to support the review. Rates are set annually by the Board.

Ad valorem levy revenues are used to support District-wide programs and administrative costs as authorized under MN Statutes 103B.241 and 103D.905. The District strives to maintain low administrative costs by developing partnerships with other agencies and participating in shared services opportunities.

Stormwater Utility Fees are used to support District projects as authorized under MN Statutes 103D.729. A stormwater utility fee is a property charge based on stormwater characteristics for a type of land use. The SWWD calculates the fee based on computed runoff volumes for a typical single family residential property. The computed runoff volume defines a unitless Residential Equivalency Factor (REF). The REF values are assigned to individual parcels based on their computed runoff volumes compared to a typical single family residential property. Fees are established and collected by water management districts and expended only for projects within the management district the revenue originates. SWWD currently includes three water management districts (web viewer). The South Washington and East Mississippi management districts were established in 2002 and 2003, respectively, as described in the 2007 WMP. The Lower St. Croix management district was established in 2011. This plan maintains those management districts.

SWWD's past Watershed Management Plan established criteria for subwatershed financing of projects which further allocated project costs to individual subwatersheds within a defined management district. Subwatershed financing is being used for implementation of the District's Central Draw Overflow project (CDO). For that project, the District's Northern Watershed is responsible for 75% of the project cost while the remaining 25% is shared by the management District as a whole. Subwatershed financing is only used for costs related to the CDO.

When planned capital projects require funding beyond the capacity of annual District revenues, the District may issue bonds to fund the project in order to maintain consistent stormwater utility fee rates for its residents. Alternatively, the District prefers to accumulate funds in lieu of bonding as authorized under MN Statutes 103B.241 when possible.

Anticipated funding needs through the life of this plan are identified in the Long Range Workplan. Annual budgeting and corresponding Levy and Utility Fees are established through a process beginning in June of each preceeding year. The budgeting process is performed during regular public meetings of the District's Board of Managers.

LOCAL WATER PLANS

Upon completion and adoption of this Plan and amendments each municipality must amend an existing Local Water Management Plan (LWMP) to conform to the requirements

PROGRAM: ADMINISTRATION

of this Plan or prepare a new LWMP which is in conformance. The LWMP must include all requirements of this Plan, MN Rule 8410.0160, and MN Statutes 103B.235, and should also address elements recommend by the Metropolitan Council in Appendix C-2 of its 2040 Water Resources Policy Plan. The LWMP must be by officially adopted within two years of SWWD's adoption of this plan or amendment.

As required in MN Rule 8410, local controls must be enacted within six months of LWMP approval. Those local controls must reflect SWWD Rules. Following adoption of this plan or amendment and prior to update of municipal local controls, SWWD will excercise its full permitting authority for development and redevelopment projects within that municipality. Following adoption of local conforming local controls, SWWD will no longer issue separate permits unless specified by municipal LWMP. The District will, however, evaluate municipal permitting procedures through a routine audit process described in SWWD Rules.

Local Water Management Plans must include a mechanism for quantifying and evaluating progress of its implementation plan and amending that plan as necessary. Upon adoption of the LWMP, Municipalities must report the results of their progress evaluation annually and within 120 days of the end of the calendar year. The report must be readily available on the municipal website.

Additionall, SWWD's specific expections for LWMP include the following:

- Participation in District planning efforts through the District's Technical Advisory Committee;
- Adopt and enforce controls consistent with this plan and District Rules in addition to State buffer and shoreland requirements;
- Develop and implement a construction site erosion and sediment control program, including identification of staff positions responsible for implementing the program;
- Develop and implement a Best Management Practice inspection and maintenance program;
- Coordinate planned Capital Improvements with the District to incorporate identified improvements; and
- Develop and utilize a mechanism for evaluating and reporting progress under the LWMP.

REPORTING AND PROGRESS EVALUATION

Consistent with MN Rule 8410, SWWD completes:

- An annual activity report for the previous year and updated workplan for the current year within 120 days of the end of the calendar year. The content of the annual activity report is specified in MN Rule 8410.
- An annual third party audit report within 180 days of the end of the District's fiscal year. Currently, the District's fiscal year ends on December 31.
- Presentation to the City or Council or Planning Commission of each Municipality within the District to discuss the annual activity report

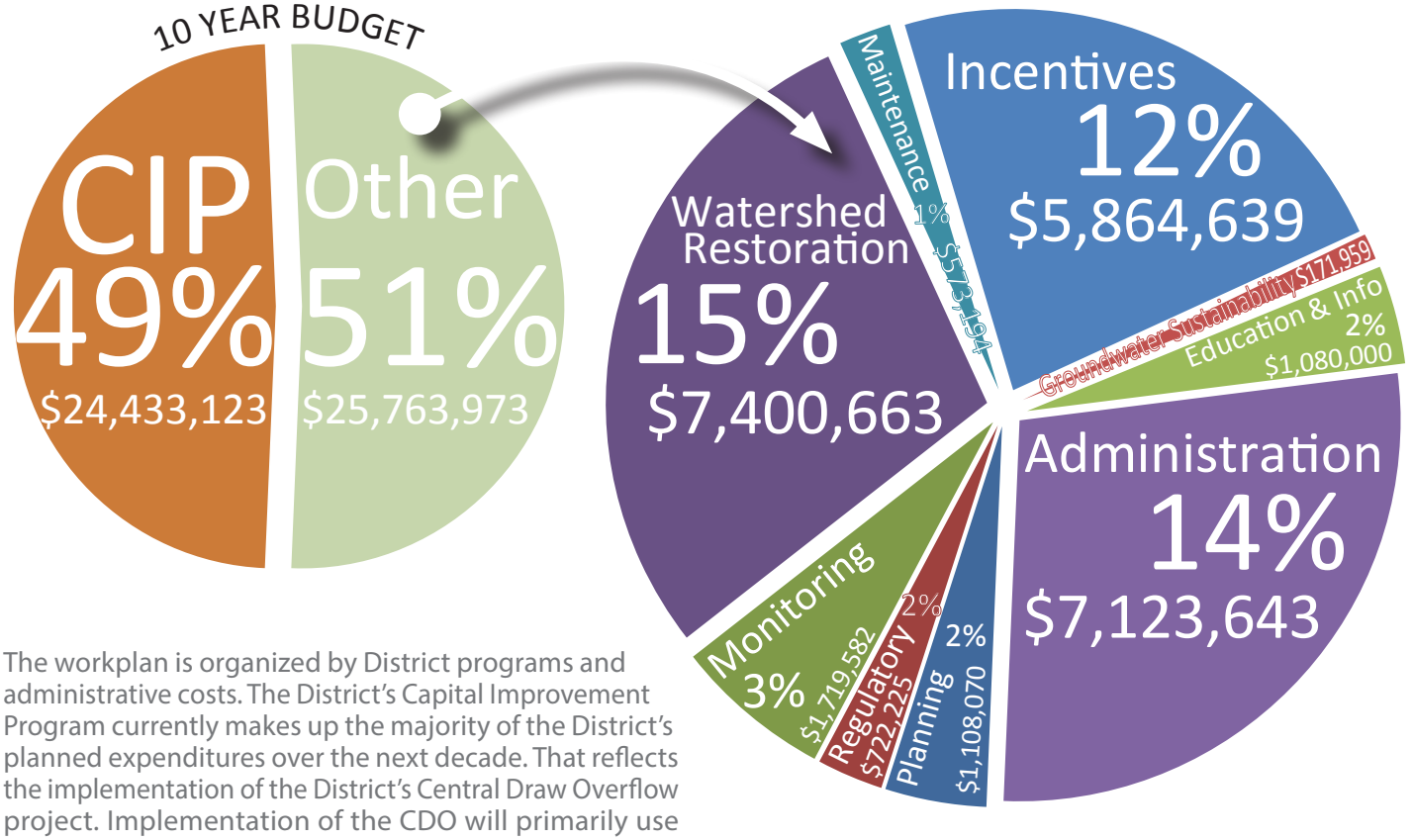
As part of its annual reporting, the District evaluates performance of programs and progress toward meeting goals through implementation indicators established in this Plan and adopted guidance documents. Results of that evaluation, budget history, and current year workplan are all included in the annual report. That evaluation is then reviewed by the SWWD Board of Managers and Citizen Advisory Committee. Should lack of progress, or changing conditions require it, a plan amendment will be initiated upon consultation with the District's advisory committees. A sample of the evaluation form to be used is included in Appendix B of this Plan.

Performance Measures:

- Annually, evaluate District progress in achieving identified issue goals and effectiveness of District programs;
- Maintain funding levels adequate to meet implementation demand of the District;
- In partnership with neighboring Districts, maintain legal boundary that reflects SWWD's hydrological boundary.

LONG RANGE WORKPLAN

The Long Range Workplan is reviewed annually by the SWWD Board of Managers in consultation with the SWWD Citizens Advisory Committee and with input from communities within the District. The workplan reflects priority issues of the District as identified in Part II of this plan and prioritizes implementation based on available resources. Priority 1 indicates implementation during years 1-3 fo the plan, priority 2 indicates implmenentation during years 4-6 of the plan, and priority 3 indicates implementation during years 7-10 of the plan. Prioritization may change with additional informaiton, coordination of local implementation efforts, or availability of outside funds.



The workplan is organized by District programs and administrative costs. The District's Capital Improvement Program currently makes up the majority of the District's planned expenditures over the next decade. That reflects the implementation of the District's Central Draw Overflow project. Implementation of the CDO will primarily use fund balance. Year to year budgeting outside of the CDO project generally grows at a 3% rate from today's budget of ~$3,000,000 which is expected to maintain a flat or negative tax impact on District landowners.

Long Range Workplan

Management Fund	Sub Fund	Activity	Funding Source	Priority	Grant Funds Necessary	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Estimated 10 year Total
			LEVY			$ 1,106,899	$ 1,132,681	$ 1,134,236	$ 1,299,088	$ 1,328,011	$ 1,352,801	$ 1,363,486	$ 1,395,840	$ 1,429,165	$ 1,463,490	$ 12,955,699
			SUF			$ 8,190,000	$ 8,045,700	$ 6,011,571	$ 2,092,918	$ 2,102,456	$ 1,872,279	$ 2,382,698	$ 2,368,429	$ 2,104,482	$ 2,115,866	$ 37,286,398
			TOTAL			$ 9,296,899	$ 9,178,381	$ 7,145,807	$ 3,392,007	$ 3,430,467	$ 3,225,081	$ 3,746,183	$ 3,764,269	$ 3,533,647	$ 3,579,356	$ 50,242,097
Programs																
Planning (non staff expenses)																
	Surface Water															
		Modeling														
		• SWW	SUF	1	N	$ 15,000	$ 15,450	$ 15,914	$ 16,391	$ 16,883	$ 17,389	$ 17,911	$ 18,448	$ 19,002	$ 19,572	$ 171,958
		• EMW	SUF	1	N	$ 50,000	$ 50,000	$ 10,000	$ 10,300	$ 10,609	$ 10,927	$ 11,255	$ 11,593	$ 11,941	$ 12,299	$ 188,923
		• LSC	SUF	2	N			$	$ 50,000	$ 50,000	$ 10,000	$ 10,300	$ 10,609	$ 10,927	$ 11,255	$ 153,091
		Resource Mgmt Plans	SUF	1	N	$ 25,000	$ 25,750	$ 26,523	$ 27,318	$ 28,138	$ 28,982	$ 29,851	$ 30,747	$ 31,669	$ 32,619	$ 286,597
		Scenario Planning	SUF	2	N			$	$ 25,000	$ 25,000	$ 25,000					$ 75,000
		Flood Response Planning	LEVY	2	N			$	$ 15,000	$ 15,000	$ 15,000					$ 45,000
	Groundwater															
		Modeling	LEVY	1	N	$ 15,000	$ 15,000	$ 15,000								$ 45,000
		Strategic Assessment Plan	LEVY	1	N	$ 5,000	$ 5,000	$ 5,000								$ 15,000
		Strategic Regulatory Coordination/Plan	LEVY	1	N	$ 2,500	$ 2,500	$ 2,500								$ 7,500
	Natural Resources															
		Greenway/Buffer Planning	LEVY	1	N	$ 10,000	$ 10,000	$ 10,000								$ 30,000
		Wetland Inventory	LEVY	1	N	$ 25,000	$ 25,000									
		Ravine Inventory	LEVY	1	N	$ 15,000	$ 15,000	$ 15,000								$ 45,000
		Aquatic Habitat	LEVY	2	N			$	$ 15,000	$ 15,000	$ 15,000					$ 45,000
Regulatory (non staff expenses)			LEVY	1	N	$ 63,000	$ 64,890	$ 66,837	$ 68,842	$ 70,907	$ 73,034	$ 75,225	$ 77,482	$ 79,807	$ 82,201	$ 722,224
I&M (non staff expenses)																
	Monitoring		LEVY		N	$ 150,000	$ 154,500	$ 159,135	$ 163,909	$ 168,826	$ 173,891	$ 179,108	$ 184,481	$ 190,016	$ 195,716	$ 1,719,582
	Watershed Restoration															
		Urban														
		• Colby	SUF	1	N	$ 50,000	$ 50,000	$ 50,000								$ 150,000
		• Wilmes	SUF	1	Y	$ 300,000	$ 300,000	$ 300,000								$ 900,000
		• Powers	SUF	1	N	$ 50,000	$ 50,000	$ 50,000								$ 150,000
		• Markgrafs	SUF	2	N			$	$ 75,000	$ 75,000	$ 25,000	$ 25,000				$ 200,000
		• Armstrong	SUF	2	N			$	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000			$ 125,000
		• Ravine	SUF	3	N						$	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 100,000
		• Miss River	SUF	2	Y			$	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000			$ 1,250,000
		• St. Croix River	SUF	3	Y						$	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 1,000,000
		Rural														
		• Source Reduction	SUF	1	N	$ 100,000	$ 103,000	$ 106,090	$ 109,273	$ 112,551	$ 115,927	$ 119,405	$ 122,987	$ 126,677	$ 130,477	$ 1,146,388
		• Ag BMP Pilots	SUF	2	N			$	$ 50,000	$ 51,500	$ 53,045	$ 54,636	$ 56,275	$ 57,964	$ 59,703	$ 383,123
		Climate Resiliency	SUF	3	Y						$	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 1,000,000
		Greenway/habitat														
		• Linear Corridors	LEVY	2	Y			$	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 700,000
		• buffers/Riparian	LEVY	3	N						$	$ 25,000	$ 25,750	$ 26,523	$ 27,318	$ 104,591
		• In-Lake/in-stream	LEVY	2	N			$	$ 25,000	$ 25,750	$ 26,523	$ 27,318	$ 28,138	$ 28,982	$ 29,851	$ 191,562
	Maintenance		SUF	1	N	$ 50,000	$ 51,500	$ 53,045	$ 54,636	$ 56,275	$ 57,964	$ 59,703	$ 61,494	$ 63,339	$ 65,239	$ 573,194
	CIP															

Last Updated: January 2017

Long Range Workplan (Continued)

Management Fund	Sub Fund	Activity	Funding Source	Priority	Grant Funds Necessary	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Estimated 10 year Total
		Central Draw Overflow		1												$ -
		• Phase I	SUF	COMPLETE												$ -
		• Phase II	SUF	COMPLETE												$ -
		• Phase III	SUF		N	$ 2,000,000										$ 2,000,000
		• Phase IV	SUF		N	$ 1,500,000	$ 250,000	$ 250,000								$ 2,000,000
		• Phase V	SUF		N	$ 150,000	$ 3,250,000	$ 3,250,000								$ 6,650,000
		• Regional Pond Improvements	SUF		N	$ 2,000,000	$ 2,000,000	$ 1,000,000	$ 50,000	$ 51,500	$ 53,045	$ 54,636	$ 56,275	$ 57,964	$ 59,703	$ 5,383,123
		• Event Response	SUF		N				$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 350,000
		Learning Center	SUF	3	Y					$	250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 1,250,000
		Grey Cloud Restoration	SUF	1	Y	$ 150,000	$ 150,000									$ 300,000
		Trout Brook Restoration		1												$ -
		• Phase I	SUF		Y	$ 350,000	$ 350,000									$ 700,000
		• Phase II	SUF		Y				$ 400,000	$ 400,000						$ 800,000
		Wilmes Lake Commercial Retrofit	SUF	1	Y	$ 500,000	$ 500,000									$ 1,000,000
	Incentives															
		BMP Cost Share	LEVY	1	N	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 750,000
		CCIP	SUF	1	N	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 5,000,000
		Flood Damage Reduction	LEVY	1	N	$ 10,000	$ 10,300	$ 10,609	$ 10,927	$ 11,255	$ 11,593	$ 11,941	$ 12,299	$ 12,668	$ 13,048	$ 114,639
	Groundwater Sustainability		LEVY	2	N	$ 15,000	$ 15,450	$ 15,914	$ 16,391	$ 16,883	$ 17,389	$ 17,911	$ 18,448	$ 19,002	$ 19,572	$ 171,958
Education & Information																
	Education															$ -
		Cooperative Ed	LEVY	1	N	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 300,000
		Experiential Programs	LEVY	2	N				$ 15,000	$ 15,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 80,000
	Information															$ -
		Research	LEVY	1	N	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 500,000
		Website/Databases	LEVY	1	N	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 200,000
Administration																
Operational																
	Manager Expenses		LEVY	1	N	$ 30,900	$ 31,827	$ 32,782	$ 33,765	$ 34,778	$ 35,822	$ 36,896	$ 38,003	$ 39,143	$ 40,317	$ 354,234
	Staff Expenses		LEVY	1	N	$ 10,300	$ 10,609	$ 10,927	$ 11,255	$ 11,593	$ 11,941	$ 12,299	$ 12,668	$ 13,048	$ 13,439	$ 118,078
	Office		LEVY	1	N	$ 30,900	$ 31,827	$ 32,782	$ 33,765	$ 34,778	$ 35,822	$ 36,896	$ 38,003	$ 39,143	$ 40,317	$ 354,234
	Insurance		LEVY	1	N	$ 20,600	$ 21,218	$ 21,855	$ 22,510	$ 23,185	$ 23,881	$ 24,597	$ 25,335	$ 26,095	$ 26,878	$ 236,156
	Outside Services		LEVY	1	N	$ 75,499	$ 77,764	$ 80,097	$ 82,500	$ 84,975	$ 87,524	$ 90,150	$ 92,854	$ 95,640	$ 98,509	$ 865,511
	Salaries/Benefits															
		Administration	LEVY	1	N	$ 212,180	$ 218,545	$ 225,102	$ 231,855	$ 238,810	$ 245,975	$ 253,354	$ 260,955	$ 268,783	$ 276,847	$ 2,432,406
		Programs	LEVY	1	N	$ 224,540	$ 231,276	$ 238,214	$ 245,361	$ 252,722	$ 260,303	$ 268,113	$ 276,156	$ 284,441	$ 292,974	$ 2,574,099
	Training		LEVY	1	N	$ 5,150	$ 5,305	$ 5,464	$ 5,628	$ 5,796	$ 5,970	$ 6,149	$ 6,334	$ 6,524	$ 6,720	$ 59,039
	Equipment		LEVY	1	N	$ 11,330	$ 11,670	$ 12,020	$ 12,381	$ 12,752	$ 13,135	$ 13,529	$ 13,934	$ 14,353	$ 14,783	$ 129,886
	Debt Service															
		EMW	SUF	1	N	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 4,000,000

APPENDICES:

1. ISSUE AND GOAL IDENTIFICATION

2. PROGRESS EVALUATION FORM

Issue Category	Issue	ID Source	Goals	Implementation Indicators	Implementation Programs	Status
Flooding						
Flood Damage Reduction and Mitigation			Minimize existing and future potential damage to property, public safety, and water resources due to flood events.			
	Wilmes Flooding	Woodbury, Past WMPs, Met Council		No increase in Wilmes HWL from development	Implementation & Maintenance, Regulatory	Flood-proofing program complete, regulatory ongoing
	ID and protect key flood storage	2007 WMP		Complete/Update inventory within 3 years; no net loss	Planning, Information, Regulatory	ID complete in SWW, still needed in EM and LSC regulatory ongoing
	Flooding Emergency Response Plan	2007 WMP		Complete within 6 years	Planning	Not Started
	ID critical inter-community flow crossings, set max rates, assess existing flow rates + enforcement	2007 WMP		Review/update within 3 years; implement necessary reductions with development	Planning, Information, Regulatory	ID complete; regulatory ongoing
	Mississippi River Flood Damage Reduction/Mitigation	Washington County, Municipalities		Maintain programmatic flexibility to respond if necessary	Planning, Implementation & Maintenance	Ongoing
	Clear Channel Pond Construction	2007 WMP, St Paul Park, Cottage Grove, MnDOT		Implement remaining portions of project as site develops	Implementation & Maintenance	Stalled
	O'Conners Lake Levels/Flooding	LSCWMO		Maintain current HWL	Planning, Regulatory	Ongoing
Overflow		Municipalities, past WMPs, Guidance Docs, Washington County, Met Council	Operational by 2020	Phase III complete by 2017; Phase IV complete by 2018; Phase V complete by 1/1/2020	Planning, Implementation & Maintenance	Phase II of V in construction
Watershed Alterations						
Surface water degradation and impairment			Protection and restoration of District resources to meet local resource goals and State standards			
	Impairment Source ID	2007 WMP		Complete management plan for all lakes/streams within 6 years; re-assess plans completed plans every 3 years to adjust strategy	Planning	Complete for waters fully within District; pending TMDLs for Big Rivers
	Protection of Resources	2007 WMP		Complete management plan for all lakes/streams	Planning, Regulatory, Implementation &	Ongoing

				within 6 years; re-assess plans completed plans every 3 years to adjust strategy; prevent new impairment listings	Maintenance	
	Restoration of Resources	2007 WMP; Met Council; MnDNR		Achieve identified watershed load reductions from completed management plans; Continue various implementation programs; ultimately de-list; Coordinate CIP with Cities through TAC	Planning, Regulatory, Implementation & Maintenance	Ongoing
	Protect high quality wetlands	2007 WMP; BWSR/WCA		No net loss in acreage or functions	Regulatory	ID complete, no efforts yet specific to protection
	Maintain WQ in landlocked basins	2007 WMP; LSCWMO		No new impairments (incl Powers, La, and OConners)	Regulatory, Implementation & Maintenance	Ongoing
	Regional TMDLs (Big Rivers)	2007 WMP, MPCA		Consider adoption of completed TMDLs for Statewide and Regional resources for which actions are identified for SWWD	Planning, Regulatory, Implementation & Maintenance	Participation in development ongoing, none finalized
	Trout Brook Remeander	LSCWMO, 2007 WMO, TB Mgmt Plan; MnDNR		Move to work plan		30% design complete, fundraising
	Trout Brook Riparian Restoration	LSCWMO, 2007 WMO, TB Mgmt Plan		Move to work plan		Ongoing
	Trout Brook Watershed Restoration	LSCWMO, 2007 WMO, TB Mgmt Plan		Move to work plan		Ongoing
	Grey Cloud Flow Restoration	2007 WMP, DNR, NPS, USFWS, USACE, GCIT		Move to work plan		Ready for final design
	Lions Park Retrofit, St Paul Park	St. Paul Park		Move to work plan		Not started
	Agriculture—little regulation, impacts from water use, fertilizer migration to ground and surface water, soil loss, etc	CAC		Develop incentive program for BMP implementation on ag lands within 3 years; Identify willing landowners and begin pilot ag BMP research program within 6 years	Planning, Implementation & Maintenance	Not Started

	Chlorides	TAC		Implement actions from Metro Chloride TMDL; Continue incentives to improve de-icing operations; Implement educational efforts to reduce salt use on private property	Planning, Implementation & Maintenance	Ongoing
	Emerging Contaminants	TAC		Evaluate impact of emerging contaminants and identify District programs or actions to control or mitigate risk	Planning, Implementation & Maintenance	Not Started
Bluff, Streambank, and Shoreland Erosion						
	State Buffer Initiative—WDs to Enforce	MnDNR		Develop reg measures to comply with State Reqs	Regulatory	New
	Bluff and Ravine erosion	LSCWMO, 2007 WMP; MnDNR; CAC		Establish and maintain 50' buffer on all bluffs, ravines, lakes, and streams; ID excessively eroding features within 3 years; Stabilize within 10 years	Planning, Regulatory, Implementation & Maintenance	Bluff rule in place needs to be expanded, no proactive efforts to date
	Ravine Park East Tributary Stabilization	Met Council		None. Should be addressed by Washington Co Park master plan	Washington County actions likely eligible for SWWD assistance through incentive programs	New
GW Sustainability						
Supply (mining and conservation)			Implement conservation efforts to ensure long term viability of groundwater resources in South Washington County.			
	ID and preserve optimal infiltration areas	2007 WMP; WashCo; MnDNR				Complete
	Assess temporal significance of recharge	2007 WMP, WashCo; MnDNR				Complete
	Implement actions identified in regional planning efforts	MnDNR, WashCo		Implement local action items	Planning, Implementation & Maintenance	Not Started
	Promote sustainable withdrawals to prevent groundwater mining	2007 WMP, WashCo, Met Counicl, MnDNR		Needs to MnDNR or WashCo lead. Will assist if needed		Not Started
	Permitting small users (Potential role of WDs)	MnDNR, WashCo		WD role?		Authority not currently

						used by SWWD
	Promote conservation	WashCo, MnDNR		Incentivize practices that reduce water demand on aquifers	Planning, Implementation & Maintenance	Ongoing
Protection			Prevent impacts to groundwater from District projects and public opperations.			
	ID/Inventory Karst Features	2007 WMP, LSCWMO		Continue enforcement of existing Karst rules	Regulatory	Ongoing
	Prevent Pollution	WashCo; MDH; Municipalities		Consider of pollution potential in siting and design of BMPs; Continue to work with agencies to improve de-icing operations	Planning, Implementation & Maintenance	Ongoing
	Lake Elmo/Oakdale Special Well Construction Area	MDH, DNR, 2007 WMP		Use alternative compliance for infiltration	Planning, Regulatory	Ongoing
	SW/GW Interactions	WashCo; Met Council		Work with partners to assess risk to groundwater resources from known interactions (and vice versa); Implement increased protections where appropriate	Planning	ID Complete—WashCo; What to do with it?
	Research: Regional Infiltration, Impacts to streams from withdrawals	WashCo; MDH; MPCA		Continue work with partners to assess potential impacts (positive and negative) of regional infiltration at CDSF on groundwater; Work with DNR and WashCo to identify resource risks from additional groundwater appropriation	Planning	Ongoing
Natural Resources						
Habitat			Protect, restore, and reconstruct native terrestrial and aquatic habitat for the benefit of resource management.			
	Aquatic Invasive Species	MnDNR; WashCo		Participate in development of regional programs prevention and control	Planning	Not Started

Terrestrial Invasives (i.e. buckthorn)	MnDNR		Participate in development of regional programs prevention and control	Planning	Not Started
	Protect rare species	MnDNR		Avoid impacts from District funded projects	Implementation & Maintenance	Not started
Implement in-Lake Management	SWWD Lake Mgmt Plans; MnDNR		Survey aquatic veg every 3 years; implement actions in adopted management plans	Planning, Implementation & Maintenance	Ongoing
	Protect and Restore high quality habitats	2007 WMP		Avoid impacts from District funded projects	Regulatory (buffers), Implementation & Maintenance	Ongoing
ID areas with potential for protection, restoration, or that could be incorporated into state wildlife areas	2007 WMP		ID within 6 years, incorporate into greenway plan where feasible	Planning	Not Started
	Avoid encroachment of development on high quality habitats	2007 WMP, WashCo		Avoid impacts from District funded projects	Regulatory (buffers), Implementation & Maintenance	Not started
Promote use of site appropriate plants	MnDNR		Promote use of site appropriate plants on District funded projects	Implementation & Maintenance	Ongoing (district projects)
	Pollinators	CAC		Promote compliance with guidance for pollinator friendly design practices as part of District funded projects; Consider preservation and restoration of native habitat and benefits to pollinators in allocating incentive funding.	Implementation & Maintenance	Not Started
Promote establishment of grassland over turf	MnDNR		Develop credit mechanism to incentivize native cover over turf within 6 years.	Regulatory	Ongoing
	Help minimize conversion of native forestland	MnDNR		Develop credit mechanism to incentivize preservation of mature trees during development within 6 years.	Regulatory	Not started
Tree Inventory	MnDNR		N/A	N/A	Municipal Role

	Greenway ID and Implementation—preserve and connect open spaces necessary for conveyance of water and protection of water quality	2003 & 2007 WMP; MnDNR		Implement incentives program and buffer regs to established planned greenway	Planning, Regulatory, Implementation & Maintenance	CDO portions complete, rest not started
Climate Change						
Adaptive Management			Facilitate increasing resilience of District resources and public infrastructure through development of information and strategies and implementation of accepted climate adaptation practices			
	Assess and manage risks of changing climate			Assess adaptive capacity of District resources and systems in developing projects; require use of up to date hydrologic data for meeting District standards	Planning, Regulatory	Ongoing (regs)
	Work with Cities to plan for changing climate and implement improvements to increase resilience	CAC		Utilize District models and predicted scenarios to identify infrastructure vulnerabilities within 6 years; Utilize CCIP to assist Cities in increasing system resiliency	Planning, Implementation & Maintenance	Ongoing
	Assess changing risks to groundwater—quantity and quality—from changing climate (increased demand, changing interactions with surface water)	CAC		Utilize District and County models to evaluate potential changes in Surface water/groundwater interactions dynamics; Promote use of alternative landscapes which require less water; promote water re-use where feasible to reduce aquifer demand	Planning, Implementation & Maintenance	Not started
Information and Education						
Information	Resource Assesment		Operate a monitoring program adequate to establish baseline conditions and identify long term trends; Operate a program adequate to detect changes in loading rates as a result of District implementation			
	• Operate Groundwater Monitoring	MnDNR; WashCo		Continue current GW	Implementation &	Ongoing

	Program			monitoring efforts, work with partners to expand as appropriate	Maintenance	
	• Operate Surface Water Monitoring Program	WMPs, Rule 8410		Implement SWWD Monitoring Plan	Implementation & Maintenance	Ongoing
	Modeling		Maintain updated, District-wide hydrological modeling to inform District and Municipal management of resources and infrastructure			
	• District-wide hydrologic model	WMP		Complete within 6 years, annually update to reflect development; calibrate to monitoring data every 3 years	Planning	Ongoing
	• Standard modeling specifications	WMP		Complete within 3 years	Planning	Ongoing
	Research		Manage the Watershed and its resources using the best known practices and strategies			
	• Pursue/support efforts to inform and improve management efforts of the District and its partners	Staff		ID and refine research and information needs as ongoing role of TAC; Pursue opportunities to provide for identified needs; annually publish summary of completed and ongoing efforts as part of annual report	Planning, Education & Information	Not Started
Education						
	• Develop and implement outreach mechanisms to reach targeted audiences					
	• ID experiential programs that utilize watershed assets through public/private partnerships	2007 WMP		Within 5 years, develop programming for SWWD prairie in partnership with EMWREP and local non-profits.		
	• Assist MS4s in meeting Education requirements of the permit	2007 WMP				
	• Establish reasonable water quality expectations with residents	2007 WMP				
Efficiency and						

Accountability						
Results Based Accountability			Utilize a Results Based Accountability approach in evaluating and refining implementation strategies for achieving resource goals and to evaluate program performance			
	RBA	Washington County		Ongoing development and use of documented strategies and actions to achieve established resource goals; Incorporate strategy documentation, progress evaluation, and annual workplan into annual report; amend watershed plan as necessary to provide the District with programs and tools necessary to implement identified strategies	Planning	New
	Progress Evaluation	2007 WMP; MN Rule 8410; PRAP	?	Biennially evaluate District progress in achieving identified issue goals.	Planning	Ongoing
Uniform Standards			Establish and maintain District controls necessary to achieve established District resource goals, comply with mandated permits and programs, and maximize regulatory consistency with neighboring jurisdictions			
	Uniform standards across Municipalities	2007 WMP		Municipal adoption/compliance with District Rules within 2 years of adoption	Planning, Regulatory	Ongoing, recent rule update
	Compliance with State permits	State agencies; 2007 WMP		Regularly update District Rules to keep pace with changing resource issues and mandated regulatory programs (MS4, NPDES)	Planning	Ongoing, recent rule update
	Uniform standards across WD boundaries	WDs; Municipalities; MN Rule 8410		Work with Washington County Consortium and neighboring WDs to ID and implement consistency where possible.	Planning	Should be revisited, ongoing/sporadic effort at consortium level

	Support Low Impact Development	MnDNR		Prevent degradation and promote enhancement of Water Quality of District resources—statistical evaluation of WQ trends.	Regulatory	Ongoing
	Erosion & Sediment Control Enforcement	MPCA		Ensure compliance across full District jurisdiction using cooperative/coordinated approach that limits duplication of efforts.	Planning, Regulatory	Ongoing
Collaboration/ Cooperation			Limit duplication of planning and implementation efforts by the District and its State and Local partners; Create efficiencies in implementation through increased partnership and coordination of CIP			
	Develop and engage an ongoing CAC					
	Improve Collaboration and Information Sharing	WashCo; MnDNR; BWSR; MPCA; Met Council		Collaborate and coordinate agency efforts through TAC; Incorporate local input through CAC; Participate in State and Regional advisory committees; combine local implementation efforts to gain economy of scale	Planning	Ongoing

PROGRESS EVALUATION

PROGRAM COMPLETION

STATUS: 5%

PROGRAM: IMPLEMENTATION AND MAINTENANCE

WATERSHED RESTORATION, RECONSTRUCTION, AND RESILIENCY

PROGRAM PURPOSE:

TO PROVIDE THE MECHANISM AND RESOURCES TO REVERSE OR ADAPT TO THE IMPACTS OF LAND ALTERATION AND CLIMATE CHANGE

PERFORMANCE INDICATOR	IMPLEMENTATION SCHEDULE	LONG RANGE WORKPLAN BUDGET	AMOUNT SPENT TO DATE	STATUS
Establishment and protection of identified greenway corridors				
Establishment and protection of vegetated buffers along streams, ravines, bluffs and around lakes and wetlands				
Stabilization of identified ravines to prevent downstream transport of sediment and nutrients				
Implementation of identified practices to increase resiliency of natural and man-made systems against land use and climate change				
Implementation of identified strategies to address aquatic and terrestrial invasive species.				
Identify willing landowners and begin operation of pilot agriculture BMP research program	2020 - 2026	$385,000	$96,250	25%

ISSUE PROGRESS / PROGRAM PERFORMANCE

Progress/performance to date. Expand on scorecard data...

RECOMMENDED ACTION / CHANGE

Document any necessary change in strategy...

CURRENT YEAR WORKPLAN

Description of planned work for current year...