Water Resources Management Plan
for the
Prior Lake-Spring Lake Watershed District
2010-2019

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Prepared by:

EOR water ecology community

Prior Lake Spring Lake WATERSHED DISTRICT

Wenck Engineers • Scientists

Water Resources Management Plan
for the

Prior Lake-Spring Lake Watershed District
2010-2019

Adopted
July 13, 2010

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SECTION 1 - EXECUTIVE SUMMARY

The Prior Lake-Spring Lake Watershed District was established on March 4, 1970 by order of the Minnesota Water Resources Board (MWRB) under the authority of the Minnesota Watershed Act (Minnesota Statutes, Chapter 112). The order was in response to a petition filed with the MWRB by resident freeholders within the watershed on June 24, 1969.

This petition sought establishment of the District for the general purposes of conserving the waters and natural resources of the watershed. The Prior Lake-Spring Lake watershed is approximately 42 square miles in size and is located in north central Scott County, Minnesota, encompassing parts of the cities of Prior Lake, Shakopee, and Savage and parts of Sand Creek and Spring Lake Townships. In addition, a portion of the Shakopee Mdewakanton Sioux Community Tribal Lands are located within the watershed. The activities and policies of the District are administered by a five-person Board of Managers appointed by the commissioners of Scott County.

The Board of Managers of the Prior Lake-Spring Lake Watershed District has adopted the following Mission Statement to guide planning and management activities in the District:

> *To manage & preserve the water resources of the Prior Lake-Spring Lake Watershed District to the best of our ability using input from our communities, sound engineering practices, and our ability to efficiently fund beneficial projects which transcend political jurisdictions.*

Minnesota Statutes 103B and 103D require that watershed districts adopt and periodically update water resources management plans. These plans must describe the physical, biological, and hydrological setting, and current and proposed land use and development. The plan must set forth goals, policies, and objectives for protecting water resources, and include an implementation plan of specific activities that will be undertaken to achieve the plan's goals. This Third Generation Water Resources Management Plan for the Prior Lake-Spring Lake Watershed District sets forth the goals, policies, programs, and projects the Board of Managers of the District will undertake during the period 2010-2019 in fulfillment of its mission and responsibilities under Minnesota Statutes.

The BWSR has adopted rules (M.R. 8410) regarding Local Plan content. Local Plans need to comply with M.R. 8410 and District requirements. In preparing a Local Plan update, unchanged information from the previous generation Local Plan may be adopted by reference. The District strongly encourages communities to develop the scope of their local plan with assistance of the District. Minimum requirements of Local Water Management Plans are detailed in Section 8.1.1 of this plan.

The Board of Managers has identified specific problems and issues impacting resources in the watershed. In general, these problems and issues can be categorized into two main areas: water quality and water quantity. Water quality issues include degradation and impairment of water bodies due to development, agricultural practices, channel erosion, internal loading, rough fish and

invasive aquatic vegetation. Water quantity issues include the increased volume of runoff from development and restricted outlets. Other issues identified include the need for ongoing monitoring data, lack of systematic inventory and assessment of wetlands, loss of wetlands within the watershed, maintenance of BMPs, and loss of groundwater recharge.

To address these problems, the Board of Managers has developed goals and policies to direct the implementation of activities set forth in this Plan as well as other planning and management activities. In general, the Plan identifies preservation and improvement of the quality of the water resources in the watershed as a high-priority goal, with the management of runoff volumes discharged to the outlet-restricted lakes an equally high priority. Development and redevelopment in the watershed will provide an opportunity to encourage developers to incorporate innovative development techniques and Best Management Practices addressing water quality and water quantity.

The plan also includes actions to implement load-reduction activities identified in current and expected Total Maximum Daily Load studies for lakes in the watershed that do not meet state water quality standards for nutrients. These actions include both watershed and in-lake practices, such as rough fish and aquatic vegetation management. The plan provides opportunities to partner and cost-share with the local governments to maximize the effectiveness of these actions through both management activities and capital projects.

Following completion of this plan, the District will embark on a process to review and refine its rules and standards regulating development, redevelopment and other land disturbing activities.

ORGANIZATION OF THIS PLAN

Section 2 of this plan presents District goals and policies while Section 3 describes generally the planning and management activities that have been developed through past and current planning efforts. Section 4 sets forth an Implementation Plan of specific activities and their estimated costs and year or years of implementation.

Section 5 details ongoing District operations while Section 6 and Section 7 present an inventory of existing and future conditions in the watershed and its hydrologic systems. Section 8 of this plan describes the requirements of local governments under this plan, while Section 9 sets forth the conditions and procedure for amending this plan. A variety of information is presented in the appendices to this plan, including current water quality monitoring results, fishery assessments, and an assessment of the outcomes of the 1999-2009 Plan.

SECTION 2 - GOALS AND POLICIES

2.1 INTRODUCTION

The District's objectives and policies have been structured around management issues which are relevant to the watershed. The goals and policies presented here have evolved with the changing membership of the Board of Managers and the changing character of the watershed itself. The District's general management philosophy is Adaptive Management: a continuing process of assessment which adapts to the changing circumstances and which incorporates new knowledge within the expanding context of prior experience. The District moderates various competitive interests (e.g., conservationists, landowners, developers, government) so as to realize the maximum long term benefit to the District's varied constituents. Basic to any effective management process is a consistent overall policy which enunciates goals, assigns relative priorities, and essentially defines the "mission".

2.2 MISSION STATEMENT

Early in the planning process for this document, the Board of Managers determined to maintain the existing mission statement to set the overall direction for the District:

> *Our mission is to manage and preserve the water resources of the Prior Lake-Spring Lake Watershed District to the best of our ability using input from our communities, sound engineering practices, and our ability to efficiently fund beneficial projects which transcend political jurisdictions.*

2.3 GOALS OF THE DISTRICT

A goal is a desired end towards which the District's policies, standards, and rules are directed. Under this definition, the District has 5 specific goals to guide its water resources planning and management functions:

1. To minimize the negative effects of water level fluctuations in the District.

   Reduce the severity and duration of flooding and low-water conditions through sound management of the Prior Lake Outlet Structure and Channel, and by implementing water volume and rate management practices identified by various studies, including the 2003 Volume Study.

2. To maintain or improve the quality of all water resources within the District.

   Reduce phosphorus and other pollutant concentrations and increase water safety and clarity in lakes, streams, and wetlands within the District. Use parameters established by TMDL studies, District water-resource specific studies, and statewide standards as goals, in that order.

3. To maintain and expand the recreational, aesthetic, and wildlife habitat benefits associated with surface water and natural spaces in the District.

   In all District programs and projects, seek to maintain or improve upon wildlife habitat, recreation benefits such as trails, and overall ecological integrity. Work with other local government units to implement and improve green corridor, parks, and other long-term water and open space plans.

4. To improve understanding of local water resources and practices among all stakeholders in the District.

   Educate and inform residents in the District about water resources and management practices. Improve general understanding of water science. Emphasize the link between local actions and water resource outcomes. Empower local residents to make positive changes for water resources.

5. To be as efficient and effective as possible in all District activities.

   Collect physical, chemical, and biological water data to target activities. Strive to achieve the greatest outcome with the least possible expenditure. Coordinate activities where appropriate with other local, regional, state, and federal agencies. Seek and utilize grant funding, where appropriate. Utilize an adaptive management approach, regularly re-evaluating programs and projects relative to expected outcomes.

2.4 POLICIES OF THE DISTRICT

A policy is a governing principal, a means of achieving an established goal. The District has elected to group management policies into 8 strategies – Capital Projects, Operations and Management, Planning, Education and Communication, Regulation, Monitoring and Research, Outlet Channel, and Administration.

2.4.1 Capital Projects

Capital Projects are significant, generally one-time and physical projects designed to significantly advance a goal or multiple goals of the District. As they are major expenditures of public resources, the District is committed to an inclusive public process and thorough scientific backing for each project that is implemented.

1. The District will use the Implementation Plan chapter of this Plan to guide the construction and funding of capital projects.
2. The District will review the capital improvements program against the Goals of the District every other year and update as needed, and submit it for review by appropriate governmental units and individuals.
3. The District will seek to incorporate into the Implementation Plan projects that further the Goals of the District, including projects to infiltrate water, promote groundwater recharge, restore wetlands identified in the Comprehensive Wetland Plan, increase storage volume in the area tributary to Prior Lake, reduce erosion and sedimentation, and demonstrate good shoreline practices.
4. The District will hold public hearings prior to ordering projects even if said projects are in the approved management plan of the District.
5. The District will seek to partner with local, regional, and state governments as well as other organizations to fund and implement capital projects identified in the Implementation Plan.
6. The District will identify and include future operation and maintenance costs in the financial assessment of future capital improvement projects.
7. The District will seek to implement items in completed TMDL and lake management study implementation plans.
8. The District will continue to implement incentive (cost-share) programs for local groups and landowners to improve water quality by installing and maintaining small water quality BMPs such as shoreline restoration, raingardens, and agricultural practices such as nutrient management plans, conservation tillage, and filter and buffer strips.
9. The District will utilize a structure of feasibility, design, construction, and maintenance for all capital projects.

2.4.2 Operation and Maintenance

The District owns several facilities, including the Prior Lake Outlet Structure and the Highway 13 Ferric Chloride Facility, and this plan includes projects to construct several more. Proper operation

and maintenance is required to ensure that the investments the District has already made both operate as intended and maximize their benefits.

1. The District will create and implement operation and maintenance plans for all existing District projects and facilities.
2. All private and public facilities not owned by the District but wholly or partially within the District, the Prior Lake Outlet Channel conveyance system or District easements will not be maintained by the District unless explicitly determined by the Board that doing so would be in the best interest of the District.
3. The District will regularly inspect all land on which the District maintains legal rights and responsibilities through ownership and/or easements, covenants, etc.
4. The District will continue to implement and refine established programs, including vegetation and rough fish management.
5. The District will coordinate all operations and maintenance work with local partners.

2.4.3 Planning

Expenditures on behalf of the public must be carefully considered to advance organizational and community goals. Planning is a way of organizing the work of the District to maximize efficiency and outcomes. It is also the means by which the District coordinates activities with local, state, and federal partners.

1. The District will review this Plan and its implementation elements every other year to ensure it incorporates new regulations and requirements, current knowledge, and reflects the current goals of the Board of Managers and the District's constituents, and pursue plan amendments as necessary.
2. The District will perform a comprehensive self-assessment after five years of plan implementation and will make revisions to the management plan and implementation plan as necessary.
3. The District will require all local management plans to include management practices consistent with the District's plan and conforming to Minnesota Rules 8410.
4. The District will require inclusion of maintenance plans within local water plans.
5. The Board adopts as goals for the lakes and natural streams in the District the State of Minnesota water quality numeric standards set forth in Minnesota Rules 7050.0222, unless otherwise superseded by a goal established in an approved TMDL or by an action of the Board.
6. The District will seek to meet and maintain pollutant load levels at or below standards as they are derived from basin-specific diagnostic and feasibility studies or Federal and State impaired waters threshold levels on waters with no studies completed.
7. The District will work with the county in the development of any future groundwater plan.
8. The District will participate in efforts to establish greenways and buffers zones with other units of government.
9. The District will implement existing lake management plans on lakes with no TMDL.

10. The District will prepare lake management plans for those waterbodies without an existing plan or TMDL.
11. The District will work with local governments and developers to incorporate water resource related goals and elements in planning and development.
12. The District will model and utilize ultimate development conditions in stormwater management efforts.The District will base stormwater management upon the critical 100-year event plus a freeboard elevation to protect improvements.

2.4.4 Education and Communication

A key role of the District lies in maintaining, updating, and disseminating information about local water resources. Effective communication also lies at the heart of changing behaviors to improve water resource outcomes and increasing personal stewardship of land and water.

1. The District will undertake all required communications as outlined in M.S. 103B and 103D.
2. The District will maintain a Citizen Advisory Committee and a Technical Advisory Committee to provide input to the Board of Managers and will periodically convene these committees to discuss issues.
3. The District will respond promptly to requests for information from the general public, and use such interactions to increase knowledge regarding water resources.
4. The District will participate in or create a coordinated education program to increase awareness of water resource issues and meet the educational requirement of the District's municipal separate stormsewer system (MS4) permit.
5. The District will seek to increase its visibility by making efforts to reach wider audiences with topics targeted to key audiences including city government, homeowners associations, lake shore property owners, elementary school children, agricultural operators and the general public.
6. The District will adopt and maintain communication tools, including a website and accounts with popular social media, in addition to traditional communication tools such as telephone, fax, mail, and email.
7. The District will maintain communication and coordinate outreach with interest groups that share the District's goals.
8. The District will maintain a library of resources and information on District projects for use by stakeholders.

2.4.5 Regulation

The District is, among other things, a rule-making body. Rules to protect water resources and minimize hazards from water are an important element of an equitable water management framework.

1. The District will continue to transfer portions of its regulatory responsibilities to local units of government upon District approval and adoption of a local water management

plan and the adoption of local ordinances and policies sufficient to implement the program.
2. The District will continue to exercise water management responsibilities in inter-community issues or whenever local units of government are not implementing regulations that are at least as protective of water resources as District rules.
3. The District will maintain open communication and periodically audit the water resources related regulatory programs of local units of government to ensure compliance with ordinances, standards and policies.
4. The District will periodically review and revise District rules and standards as needed.
5. The District does not serve as the LGU for any of its member communities in regard to the Wetland Conservation Act.
6. The District requires notice of all pending applications, hearings, and technical evaluation panels and will provide review and comment on pending Wetland Conservation Act applications.
7. The District recognizes and requests that administration of Scott County Ditch 13 will remain with Scott County, the Ditch Authority.
8. The District will revise its rules and standards to include performance-based volume management that specifies outcomes rather than prescribes methods.
9. The District will support the efforts of other regulatory bodies responsible for overseeing agriculture chemical use, conservation plan establishment, and feedlot regulation within the District.
10. The District will require agreements or maintenance plans for all developments permitted by or within the District.
11. The District will require that improvements to the ditch system will be subject to watershed district involvement as outlined in M.S. 103D.

2.4.6 Monitoring and Research

Monitoring of water resources increases the understanding of the hydrology, hydraulics, and aquatic ecology of the District. Greater understanding of water resources is a goal of the District, and allows for more precise implementation of projects to more efficiently meet needs. Research expands on monitoring by working with local research organizations to test new methods for managing water and explore new theories of water systems.

1. The District will implement its monitoring plan to gather necessary information to manage water resources according to the District's established Goals.
2. The District will update its monitoring plan every year.
3. The District and its partners will periodically update hydrologic and hydraulic modeling within the watershed.
4. The District will share its own water quality data with the public and local governments, and encourage and participate in data sharing programs conducted by other entities.
5. The District will continue to monitor aquatic vegetation on designated lakes within the District.
6. The District will periodically assess progress toward meeting federal, state and District water quality goals in Impaired Waters in the District.

7. The District will support the DNR in their efforts to monitor and manage aquatic species populations.

2.4.7 Outlet Channel and Structure

Maintaining the Prior Lake Outlet Channel is a core responsibility of the District. As a channel that winds through multiple jurisdictions, serves as the only outlet for Prior Lake, and is the main drainage for a significant watershed, the outlet is a significant regional resource. The District balances the needs of lake owners with the needs of jurisdictions and landowners along the channel in its management actions.

1. The District will continue to exercise and maintain rights and responsibilities set forth in the Prior Lake Outlet Channel Memorandum of Agreement (JPA/MOA) executed in 2007 between the District, the City of Prior Lake, the City of Shakopee and the Shakopee Mdewakanton Sioux Community as well as other agreements so executed or amended.
2. The District will complete restoration of the Prior Lake Outlet Channel and will address erosion and sedimentation problems by monitoring conditions and undertaking any necessary repairs and periodic maintenance to maintain capacity and minimize downstream sediment and pollutant loading and discharge.
3. The District will continue to organize regular meetings of both policy and technical staff members of the organizations in the JPA/MOA.
4. The District will complete the correction and acquisition of easements for the Prior Lake Outlet Channel, with a goal of owning sufficient land and rights to perform ongoing maintenance work.
5. The District will review and update the operation and maintenance plan for the Prior Lake outlet structure as alterations are made to the structure.
6. The District will inspect and monitor the Outlet Channel and associated easements for water flow, erosion conditions, vegetative issues, and other concerns as identified by the members of the JPA/MOA, and report the results of monitoring to the JPA/MOA members.

2.4.8 Administration

Efficient and effective organizational operation relies upon well-executed administration. The District aims for continuously improving administration of all of its activities.

1. The District will administer programming in a fiscally sound manner at low and reasonable tax rates.
2. The District will seek an appropriate balance between the use of outside professional services and District staff.
3. The District will re-evaluate professional services, including legal, engineering, accounting, and auditing, every other year.
4. The District will adopt and update policies to direct internal operations, including fiscal and personnel policies and Board bylaws.

5. The District will pursue water quality grant programs. On-going grant programs will be continued to maximize return on diagnostic study investments.

SECTION 3 - MANAGEMENT PLAN

3.1 INTRODUCTION

Problems and issues in the Prior Lake-Spring Lake Watershed District typify problems found in several other metropolitan-area watersheds. The central portion of the watershed has long been developed with well-established urban infrastructure, land uses, and behavioral habits. The northern portion of the District is suburban in character. The southern portion of the District is relatively undeveloped and rural in character. As the suburban area continues to urbanize and the rural areas change land use, the existing developed areas around Prior and Spring Lakes and the lakes themselves can expect to receive larger quantities of runoff potentially conveying more sediment and nutrients.

Maintenance of high quality surface waters and ample quantities of groundwater in the watershed is a growing problem in Scott County and for the Minnesota River Basin as a whole. The dynamic nature of the watershed and the projected increases in development activity will be a challenge for the District if the benefits of sound watershed management are to be realized. In order to secure these benefits, this management plan has attempted to recognize the diverse needs of the various subwatersheds in the District's boundary.

This section of the plan describes the general water management strategies of this plan. While the overall goals and management strategies of the District have not changed drastically since the previous plan, they have been refined to reflect the knowledge gained and lessons learned from implementing the 1999 Plan. Problems and issues and general management strategies in response are summarized in Table 3.3 at the end of this Section.

3.2 GENERAL WATER MANAGEMENT STRATEGIES

The general water management strategies for the Prior Lake-Spring Lake Watershed District Management Plan reflect the goals and policies developed by the Board of Managers. It is understood that occasionally water management strategies will not be feasible or practical in all instances. In fact, they may be in conflict and require tradeoffs with each other. When this occurs, the Board will make a reasonable decision based on available information and overall circumstances.

There are three major management areas which dominate the discussions of the Managers and advisory committees. Due to their overwhelming influence on the development and structure of the management plan, these areas are more thoroughly discussed to aid in providing context and understanding of these three critical areas. The three major management areas are as follows:

- Water Quality
- Volume Mitigation
- Outlet System Management

Following this background text, the strategic implementation plan will outline the individual management actions proposed by the District on a subwatershed basis. In addition, this plan incorporates by reference the Prior Lake Outlet Channel and Lake Volume Management Study dated May 2003, a copy of which is available for review at the District office.

3.2.1 Water Quality

The water quality strategy for the Prior Lake-Spring Lake Watershed District consists of the following primary elements:

- A monitoring program to help detect and diagnose water quality problems in the District.
- Development of Lake Management Plans and, for waters listed on the State Impaired Waters List, Total Maximum Daily Load (TMDL) studies and implementation plans.
- Funding of studies and participation in specific projects and demonstrations designed to improve water quality and runoff management. These may include the following:
    - In-lake phosphorus reduction through carp control and Curlyleaf pondweed management.
    - Technical and financial assistance for innovative water management practices for new or redevelopment.
    - Funding of large scale in District BMP demonstration sites, including residential, commercial and agricultural.
- Implementation of BMPs on a watershed wide scale.
- Enforcement of watershed rules and standards for new development, redevelopment and other land disturbing activities.

The monitoring program, lake management planning and TMDL development, funding of studies and participation in special projects and demonstrations, and permitting and compliance efforts are described below. Watershed standards related to water quality are codified in the District's rules (see Appendix D).

3.2.1.1 Monitoring Program

To guide the overall monitoring effort, the District has in the past and will continue to annually prepare a monitoring plan which identifies the type and frequency of monitoring at each designated site in the watershed. The 2010 Monitoring Plan is included in Appendix K.

The monitoring program currently consists of lake, stream, and outlet monitoring. Lake monitoring is completed through support of the Metropolitan Council's Citizen Assisted Monitoring Program (CAMP) and more in-depth monitoring completed by the District. Lakes annually monitored through the CAMP program include Cates, Fish, Lower Prior, Upper Prior, and Spring. In addition, Fish, Lower Prior, Upper Prior, and Spring are and will be monitored

more extensively by the District on a rotating basis to acquire more detailed information about these lakes, including temperature, oxygen and phosphorus profiles. Three stream monitoring stations have been permanently located on County Ditch 13 to evaluate the treatment efficiencies of the Highway 13 Wetland and ferric chloride treatment system. This stream monitoring consists of continuous flow monitoring and the collection of grab samples for analysis of water quality parameters. In addition, the District will periodically obtain grab samples and conduct synoptic water quality surveys in the upper watershed and in the Prior Lake Outlet Channel when it is flowing.

Aquatic plant monitoring will also be continued on District lakes to track the type and abundance of emergent, floating and submerged aquatic plants. This will assist the District in its efforts to manage the invasive plant Curlyleaf pondweed and its associated water quality impacts. The aquatic plant monitoring will also help the District track the success of efforts to protect and promote the growth of native aquatic plants to enhance lake clarity.

Finally, additional lake and stream monitoring will be completed as necessary to support the development of lake management plans and TMDLs, to track the effectiveness of management practices installed in the watershed and as part of other special projects as appropriate.

Appendix D shows the 2007 lake monitoring results, including trend data. Water quality trend data is also reported in the District's Annual Report. As a larger database of data is collected, additional analysis will be completed and reported as part of the Annual Report.

3.2.1.2 Lake Management Plans and TMDLs

A Sustainable Water Quality Management Plan for Spring and Prior Lakes was completed in 2004. In 2006 a Sustainable Lake Management Plan was completed for Fish Lake. The District's Water Resources Management Plan incorporates by reference both of these plans, which are available for review at the District office or website. No additional lake management plans are contemplated during this ten year planning period.

In addition to developing lake management plans, the District intends to facilitate the development of TMDL studies and implementation plans for impaired waters within the watershed, which are shown in Table 3.1. It is expected that the MPCA will fund these TMDLs. A nutrient TMDL for Spring and Upper Prior Lakes was completed in 2011, and the implementation plan was completed in 2012.

The District plans to also initiate TMDL development for currently listed and future impairments of the lakes within the District as necessary. The District has and will continue to work closely with state and federal agencies, local government, and interested citizens in the TMDL development process.

Table 3.1. State of Minnesota 303(d) List of Impaired Waters in the District.

Water Body	Year First Listed	Affected Use	Pollutant or Stressor	TMDL Target End Date
Fish Lake	2006	Aquatic Consumption	Mercury in fish tissue	*
Fish Lake	2002	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators	2018
Pike Lake	2002	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators	2018
Lower Prior	2002	Aquatic Consumption	Mercury in fish tissue	*
Upper Prior	2002	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators	2010**
Upper Prior	2002	Aquatic Consumption	Mercury in fish tissue	*
Spring Lake	2002	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators	2010**
Spring Lake	1998	Aquatic Consumption	Mercury in fish tissue	*

*TMDL has been developed by the Minnesota Pollution Control Agency.
**TMDL study completed in 2011; Implementation Plan approved in 2012.

3.2.1.3 Special Projects and Demonstrations

A number of special projects and demonstrations have been completed by the District throughout its existence. Many of these were done to address the (historical) Board of Managers' desire to improve Spring, and consequently, Prior Lake water quality for recreational use. Summaries of past projects are given in final project reports as well as District Annual Reports for the years in which the projects were implemented.

Many efforts are still on-going, including wetland restoration, chemical stormwater treatment, stormwater basin improvements, shoreland restoration/aquascaping, and public education. On-going efforts for these elements are described below, along with new efforts planned by the District based on the knowledge gained from earlier projects. Additional descriptions and background are contained in Section 4 Implementation Plan as well as the Self Assessment contained in Appendix I. The District will continue to engage other projects and alternatives to address District problems and will only readdress these specific actions as they become feasible and effective.

Wetland restoration will be an on-going activity for the District as part of the Volume Mitigation activities described in the next subsection. Efforts for restoration will consist of referral of restorations to other appropriate agency programs, projects required as a part of future development as well as easement acquisition and restoration by the District itself.

A ferric chloride ($FeCl_3$) stormwater treatment system was constructed on County Ditch 13 in 1998. In 2003, an analysis of the system's effectiveness was completed and the system was determined to be performing as designed (Barr Engineering, 2003). In 2010 a follow-up analysis was completed and determined that the system removes approximately 30% of phosphorus from County Ditch 13 (EOR, 2010). Operation of the $FeCl_3$ treatment system is currently guided by a permit issued by the MPCA that expired as of 2009. Design of alterations of the system to meet new MPCA guidelines is nearly complete, and construction is anticipated in 2013. Once the facility has been reconstructed, continued operation will consist of routine checks and maintenance, the purchase of the chemical flocculate (i.e. ferric chloride), compliance monitoring and annual reporting.

Public education and information is also an on-going effort. Activities include developing and printing the District's annual report and newsletter, developing press releases and fact sheets, providing grants for school-based watershed education, sponsoring educational workshops and tours, attending community events, and developing and supporting focused education efforts as applicable. This effort is also a critical component of the District's Storm Water Pollution Prevention Program for the fulfillment of its obligations under the National Pollutant Discharge Elimination System (NPDES) General Permit for Small Municipal Stormsewer Systems (MS4 Permit).

Aquatic Plant Management Plans have been completed for Spring Lake (2001), Fish Lake (2005) and Upper Prior Lake (2005). These plans identified the need for Curlyleaf pondweed treatment to control nuisance growth of the plant, reduce the associated water quality impacts of this source of in-lake phosphorus recycling and promote the growth of native plants. The District has been monitoring aquatic plants in District lakes and treating for Curlyleaf pondweed as needed since 2001.

The Aquatic Plant Management Plans, as well as Sustainable Water Quality Management Plans and TMDLs have identified the necessity of reducing the carp population in the lakes. Reduction of carp and other rough fish populations will reduce phosphorus recycling and disturbance of native aquatic plant beds. As detailed in Section 4, the District plans to continue efforts to study the carp population and to adjust management efforts appropriately as the carp density is better understood. These activities will be coordinated as part of the District's in-lake phosphorus reduction efforts, and will utilize expertise from the U of M Sorensen Lab and other watershed districts, when possible.

The District also plans to work with the Scott Soil and Water Conservation District (Scott SWCD) to identify erosion problems along the main tributary in the watershed, County Ditch 13, as well

as on contributing farmland. As problem locations are identified within the watershed, the District will work with the SWCD to prevent erosion and complete restoration/stabilization projects using federal, state, and District funding.

The District has a program in place to promote the adoption of water quality and volume control BMPs by providing technical and financial (i.e. cost-share) assistance for the incorporation of these practices into development and redevelopment projects. This effort will be integrated with the District's permitting and plan review program to provide incentives for creative stormwater management approaches in new and redevelopment. The technical and financial assistance will be available for efforts that go beyond the requirements of the District's rules and standards and improve water quality or reduce runoff volume, including individual landowner efforts.

Finally, the District will seek to fund other research studies to develop and promote the technology associated with newly emerging BMPs. The District has a goal of funding local demonstration sites for BMPs, including innovative water quality, volume management and agricultural BMPs, for the purposes of increasing research data on new and developing BMPs, as well as demonstrating, to a satisfactory level, to developers and homeowners the benefits of these BMP technologies. The District expects both successes and failures to occur through this initiative but also expects to gain valuable data and experience from each.

3.2.1.4 Enforcement of Rules and Standards, Permitting and Compliance

The District has established rules and standards for land disturbing activities (see Appendix D). These rules address water quality, rate control, and volume control requirements for new and redevelopment, and are implemented through a permitting program. The permitting program also helps fulfill the District's obligations under its MS4 Permit. All of the local units of government (LGUs) within the watershed also are permitted MS4s.

A brief overview of the District's rules and standards is as follows. All land disturbing activity not otherwise exempt as defined in the rules must undertake stormwater management to achieve the following:

- Runoff rates from the 2-year, 10-year, and 100-year event after land alteration must not exceed the rates prior to land alteration.
- Runoff must be treated prior to discharge into waterbodies using either permanent sedimentation ponds or alternative BMPs to achieve the removal of 60 percent of total phosphorus.
- The site must infiltrate one-half inch of runoff generated on new impervious surfaces within 72 hours.
- An erosion and sediment control plan must adequately stabilize soils and control sediment from leaving the site.

- Fill within the floodplain must be mitigated by providing compensating flood storage.
- Vegetated buffers a minimum of 20 feet wide and an average of 30 feet wide must be provided adjacent to wetlands and watercourses.

The District will update its rules and standards in order to adequately address its current goals. The rules and standards will be updated to include more specific information on volume management, as well as more comprehensively address standards for development and redevelopment within the District. In addition, the District will work with Scott County and other jurisdictions to, where possible and appropriate, simplify and standardize the rules and standards with other jurisdictions' regulations.

The District has also worked closely with the LGUs to encourage them to adopt Local Water Plans and official controls that are equivalent with the District's Plan and rules and standards. This equivalency has been established for all LGUs except the City of Shakopee, which is in progress. Through the equivalency process, the District has transferred the responsibility for implementing the District standards to the LGU through execution of a Memorandum of Agreement. The District will continue to review development plans as a member of the LGUs review team, but will not issue separate permits so long as the terms of the MOA are complied with and the District's standards continue to be met. As the District's rules and standards are updated, LGUs will need to reestablish equivalency by incorporation of the District standard changes as outlined in the respective MOAs.

The District plans to work with LGUs to develop a project for systematically inspecting all buffer strips and infiltration/volume control areas in the watershed. Due to the distributed nature of BMP techniques, the project will need to incorporate electronic technology for in field monitoring and enforcement. This effort will be part of both the District's efforts to enforce the watershed rules and standards and a means to ensure proper maintenance and effectiveness of BMPs.

Finally, the District will continue to coordinate its efforts closely with LGUs and state and federal agencies to build on collective efforts to protect and improve water resources. The District also intends to incorporate minor updates to its Water Resources Management Plan as needed, with a comprehensive update occurring ten years after final approval.

3.2.2 Volume Mitigation

Managers structured goals and policies in an effort to minimize runoff volume which would eventually make its way to the small capacity outlet at Lower Prior Lake. The Volume Mitigation effort is also important to the District's overall water quality goals, as many volume control best management practices (BMPs) addressed by the program, such as wetland restoration, also provide water quality benefits.

Given the lower infiltration rates found in the soils of the watershed and the lack of direct zoning authority, the Managers would prefer to protect critical landscape features which allow for retention or natural conveyance of stormwater. Protection of priority areas identified by the District will be complemented by other on-going efforts in the areas of intergovernmental coordination, District regulations and cooperative funding approaches. Priority areas to be targeted by the District have been identified by a Storage and Infiltration Study completed by the District in 2004 (Prior Lake-Spring Lake Watershed Storage and Infiltration Study, Wenck Associates, 2004). This study will be periodically updated and refined by the District, with assistance from the Scott Soil and Water Conservation District (SWCD), to reflect current information. The City of Prior Lake has indicated that it intends to take the lead on protecting and restoring identified drained wetlands and storage areas within the City boundaries and the Orderly Annexation Area. This will allow the District to focus its efforts on sites within the unincorporated areas of the watershed. Through a partnership with the Scott SWCD, potential sites will be investigated and prioritized, additional sites will be identified, and the storage and restoration projects will be pursued. Additionally the District has partnered with Scott SWCD and will work with Spring Lake Township to do an in depth analysis of the township's LID land use plan and determine at what level the plan helps to achieve the District's volume management goals. This analysis will assist in determining volume reduction targets for the balance of the Upper Watershed and identifying target areas for land or easement acquisition.

The Managers' policies reflect a shift toward promoting retention of water within the watershed and realizing the associated water quality benefits by increasing infiltration and eliminating drainage of landlocked areas, both large and small. Primary emphasis by the District is to either purchase easements or land prior to development or at the time of open space development platting to protect topographic lows, which will include watercourses and wetlands, and natural areas that promote infiltration or plant uptake/transpiration. These easements will also include upland buffers where appropriate. This will protect the natural drainage system, as well as promote water quality and wildlife habitat. District funding required is envisioned as being relatively large but this large expenditure will be offset by elimination of the need for a larger capacity lake outlet. Efforts will be coordinated with county and municipal public works and parks departments to facilitate greenway establishment, preservation of natural conveyance facilities, and promotion of future regional ponding/storage facilities.

The Volume Mitigation Program also includes funding for wetland restorations, storage basin development, and incentives for adoption of agricultural BMPs, which are all efforts designed to protect or increase infiltration and storage within the watershed and improve water quality. The District will leverage the funding available through other state and federal programs by providing additional incentives and by working closely with other agencies and organizations promoting wetland restoration and creation.

3.2.2.1 Process

In 1999, the District obtained a Flood Damage Reduction grant from the Minnesota DNR, which paid for a portion of a Voter Attitude Survey on Flooding and Open Space. This study showed that voters agreed with the District Managers' decision regarding a balanced approach for managing the lake levels and the outlet channel in combination with land management, and perceived open space and environmental preservation as a very important part of the plan.

The Volume Mitigation Program will need to continually evolve in order to take advantage of opportunities as they arise and other governmental programs, and to adjust to the market forces dictating land values in the District. The program will largely focus on implementation of and evaluation of the following practices, in addition to rules and standards modifications to control runoff volumes from new and redevelopment:

1. Participation in Federal, State and local financial incentive programs for agricultural BMPs (e.g. EQIP, CREP). Enhancement of existing program incentive payments to make programs more attractive.
2. Providing financial incentives for filter strip and wetland restoration programs offered by LGUs and other agencies and non-profits (e.g., CRP, filter strips, NRCS wetland restoration projects). Enhancement of existing program incentive payments to make programs more attractive. Promotion of conservation tillage, nutrient management plans and filter and buffer strips on ditches and waterways.
3. Purchasing easement/property rights for priority parcels identified by various inventory efforts and assessments. Various land inventories completed as part of the Storage and Infiltration Study have identified priority parcels that because of their location could provide important runoff storage and water quality treatment benefits.
4. Purchasing easement/property rights in new development projects. There occasionally are opportunities to obtain additional runoff storage volumes in new developments beyond that required by the District's rules and standards.
5. Providing financial incentives for wetland restoration or enhancement projects not eligible under other programs that increase watershed storage and improve water quality, provided that the wetland is protected by a perpetual conservation easement.
6. The District will initiate and seek opportunity to partner in the study, promotion, implementation and evaluation of soil reclamations/enhancements, high density and commercial development volume mitigation BMPs, and other volume mitigation strategies as deemed appropriate and in agreement with the goals of the Board of Managers.

3.2.3 Outlet System Management

The Prior Lake Outlet Channel functions as a trunk drainage system that begins at the outlet structure from Lower Prior Lake and extends to the Minnesota River. The channel has been divided into eight segments for planning and management purposes, as shown in the Outlet Channel map in Appendix B.

The District has elected to maintain existing discharge rates of the outlet and address efforts to retain water in upland areas of the District by integrating BMPs which limit runoff and to actively protect critical natural storage and conveyance facilities within the southern portion of the District. The ultimate goal of retaining water upstream is partially based on the increased channel costs associated with an increase in flow.

Table 3.2. Channel Improvement Goals, Prior Lake Outlet Channel and Lake Volume Management Study.

Hydrologic Parameters ▪ Minimize property damage to landowners along the channel, while minimizing Prior Lake water level fluctuations and property damage to lakeshore owners. ▪ Preserve Prior Lake-Spring Lake Watershed District's discharge capacity rights to the channel. ▪ Require entities using the channel as a stormwater trunk facility to provide or pay for this capacity and contribute proportionally to the maintenance trust. ▪ Use a holistic approach that combines upstream runoff management within the watershed to minimize runoff with an efficient outlet and stable channel. ▪ Crossings constructed after the channel or that are damaged due to lack of repair or maintenance are and will remain the property and responsibility of the land owner. ▪ Issues of steady base flow or navigation were not considered as this outlet channel was designed as an intermittent flow regime.
Stabilization ▪ Stabilize channel banks so that they stay within corrected easement areas. Easements will be self monumenting. ▪ Use an integrated structure approach to soil stabilization focused on soil/root interface rather than a surface application approach: maximize rhizosphere (i.e., root zone) and minimize use of hard armor by using vegetative soil stabilization whenever possible. ▪ Where hard armor is necessary: use fieldstone (igneous rock) rather than limestone to maximize life span.
Natural Aesthetic ▪ Give this man made channel (ditch) a more natural channel stream feel. ▪ Stabilize in a natural aesthetic. ▪ Maximize use of vegetative soil stabilization and minimize use of hard armor.
Natural Corridor ▪ Provide wildlife habitat structure both in aquatic and terrestrial zones of the Prior Lake Outlet Channel where possible. ▪ Preserve, protect or enhance the aquatic environment of the waterbodies along the outlet channel. ▪ Preserve/ create/ enhance a community asset that combines a corridor for watchable wildlife and native vegetation with a functional channel for conveying water runoff.
Maintenance ▪ Secure and preserve maintenance access throughout channel length. ▪ Minimize long term maintenance needs and capital expenditures for the outlet system. ▪ Minimize maintenance by mimicking presettlement vegetation structure. ▪ Anticipate maintenance requires controlled burns, selective shade reduction and other measures to maintain integrity of vegetative treatments and their rhizosphere.

Table Source: Prior Lake Outlet Channel and Lake Volume Management Study, 2003.

The Joint Powers Agreement (JPA) for the Prior Lake Outlet Channel was executed in 1981 by the District and the Cities of Prior Lake and Shakopee. It has since been modified to reflect the shift in use of the outlet and channel from primarily a flood relief system to a trunk stormwater system, and to incorporate the plans for the restoration and enhancement of the outlet channel. On

October 1, 2006 the District, the Cities of Prior Lake and Shakopee, and the Shakopee Mdewakanton Sioux Community (SMSC) signed a revised JPA/MOA (Memorandum of Agreement) for the operation, maintenance and use of the outlet channel. A cost-share formula was also developed for the fair distribution of channel construction, operation and maintenance costs. The JPA/MOA remains in effect and is included in Appendix F.

3.2.4 Outlet Capacity

The District completed the Prior Lake Outlet Channel and Lake Volume Study in May 2003, which concluded that a number of complementary strategies will be necessary to keep lake levels from increasing under future conditions. This report and other calculations were taken into consideration in the development of the Outlet Channel JPA/MOA and will be reviewed and updated as significant development occurs in the outlet channel watershed. The Board recognizes that the development density that will occur in the County's Urban Expansion, Urban Transition, and Rural Residential Growth Staged areas greatly influences the success of these strategies and accuracy of the models, and therefore believes that low to medium density development is more sustainable than high density development for this area.

Peak discharge rates from the lake will have a direct effect on downstream improvements required in the outlet system. It is known that additional capacity will be required to accept fully developed drainage areas from the cities of Prior Lake and Shakopee. These needs were assessed as part of the Prior Lake Outlet and Lake Volume Study and the formulation of the Outlet Channel JPA/MOA.

3.2.5 Outlet Costs

Modeling indicates that under constant discharge conditions, increasing the outlet capacity from 65 to 100 cfs could potentially lower the flood elevation of Prior Lake from 907.6 to 906.7 feet. This could potentially reduce the number of homes with low water entry points below the 100-year regulatory flood elevation of 909±. However, as shown in the 2002 Floodproofing and Buyout Study for Prior Lake-Spring Lake Watershed District and the 2003 Prior Lake Outlet Channel and Lake Volume Management Study, this would be difficult to permit and would require almost $10,000,000 in improvements to the outlet channel and structure. The District currently has an approved MN DNR permit for a maximum discharge rate of 65 cfs and believes that maintaining this maximum rate will provide a cost-effective level of protection when the land controls described earlier are combined with a less restrictive outlet operating plan.

In the winter of 2005-2006, the District, City of Prior Lake, City of Shakopee and Shakopee Mdewakanton Sioux Community initiated the construction of the Outlet Channel Restoration and Enhancement Project. The project will continue to be constructed in stages, over several years. This project will be a joint effort of the cooperators of the JPA/MOA. The cost-share breakdown

is based on the formula devised for the final draft of the Outlet Channel JPA/MOA, and additional details can be found in the JPA/MOA documents attached in Appendix F.

The District anticipates financing its share of the Outlet Channel Restoration and Enhancement Project and the construction of the new outlet structure through a combination of direct levy, some of which has already been completed in anticipation of the project, and the sale of bonds. Ongoing operation and maintenance of the outlet channel and structure will be financed through the District's annual levy.

3.3 ISSUES IDENTIFICATION

The ongoing efforts of the Board of Managers and the District staff have addressed many of the issues identified in the previous Management Plan. However, there are a number of ongoing issues and problems yet to be resolved, as well as the potential for new issues over the coming ten year planning period. These are detailed in Table 3.3 below.

Table 3.3. Problems and Issues in the Prior Lake-Spring Lake Watershed District and general solutions and actions.

Problem	General Solutions	Goals	Actions
WATER QUALITY			
1. There are Impaired Waters in the District	• Complete TMDLs • Complete TMDL Implementation Plans • Work in partnership with MS4s to implement TMDL actions	4	• Operate and maintain ferric chloride system • Implement new water quality and volume management rules and standards • Continue and expand aquatic vegetation surveys and provide vegetation management as necessary • Provide rough fish management • Work with SWCD and operators to improve agricultural practices • Implement upper watershed volume management practices • Undertake internal load management project(s)
2. Minnesota River Impairment contribution	• Improve water quality in Spring and Prior Lakes • Improve and maintain Prior Lake Outlet Channel	1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13	• Undertake actions to improve impaired waters in the District • Complete restoration of the Prior Lake Outlet Channel • Implement new water quality and volume management rules and standards
3. New development may increase pollutant load and runoff volume and degrade waters	• Revise rules and standards to incorporate nondegradation for new development	3, 4, 5, 6, 7, 13	• Implement new water quality and volume management rules and standards
4. Maintain water quality for resources that meet or exceed state standards	• Prevent degradation from development • Encourage adoption of BMPs • Improve upstream resources	3, 4, 5, 7, 13	• Implement new water quality and volume management rules and standards • Continue and enhance education and communications program • Provide opportunities for demonstration projects • Implement upper watershed water quality and volume management BMPs • Improve upstream water resources
5. Potential for channel erosion in the upper watershed	• Work with SWCD to identify and address problem areas	6, 7, 9, 13	• Annually confer with SWCD about potential areas of concern • Partner with SWCD on solutions to address identified problems

Problem	General Solutions	Goals	Actions
6. Significant presence of rough fish in lakes	• Quantify problem • Determine feasible options to address the problem	4,5	• Contract or partner with consultant and U of M to continue to study problem and identify possible solutions • Implement most cost-effective option
7. Invasive aquatic vegetation contributes to water quality problems	• Quantify problem • Determine feasible options to address the problem	4, 5	• Contract with consultant to identify problem • Implement most cost-effective option for aquatic plant management
8. Agricultural practices are a source of nutrient and sediment load to lakes and streams	• Work with SCWD to help them implement their programs	1, 3, 4, 8, 10, 12	• Provide cost-share assistance to the SWCD • Work with SWCD to meet with private landowners to provide information and technical resources
9. Increase awareness and adoption of BMPs to reduce runoff and improve water quality	• Improve awareness of BMPs • Increase adoption of BMPs	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	• Complete BMP and easement inventory • Continue and enhance education and communications program • Provide opportunities for demonstration projects • BMP cost share with LGUs and property owners
10. Need ongoing water quality data	• Maintain a monitoring program	4, 5, 10	• Continue participation in CAMP program • Implement District Monitoring Program in accordance with Monitoring Plan
WATER QUANTITY			
11. The outlet of Prior Lake is restricted	• Complete outlet structure • Complete outlet channel • Minimize new inflows • Stabilize shoreline • Address low-lying houses	1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13	• Complete the outlet structure • Implement new water quality and volume management rules • Increase education and outreach for lakeshore owners • Provide opportunities for demonstration projects • Implement upper watershed volume management BMPs
12. Spring Lake outlet has potential spring time blockage	• Work with local governments and residents to address issues when they occur	6, 9	• Work with local governments and residents to address issues when they occur

Problem	General Solutions	Goals	Actions
13. Cates Lake has restricted outlet	• Assist city in resolving restricted outlet issues	3, 6,	• Provide assistance as requested; the City of Savage has said that it will lead efforts to resolve this issue
14. Increase awareness and adoption of BMPs that balance runoff volume management, lake levels, and water quality needs	• Improve awareness of BMPs • Increase adoption of BMPs	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	• Complete BMP and easement inventory • Continue and enhance education and communications program • Encourage adoption of Low Impact Development design principles • Provide opportunities for demonstration projects • BMP cost share with LGUs and property owners • Encourage forestation and use of native vegetation
15. Need ongoing water quantity data	• Maintain a monitoring program	1, 5, 10	• Implement District Monitoring Program in accordance with Monitoring Plan
Other Issues			
16. Impacts to groundwater resources including loss of groundwater and potential groundwater quality impacts	• Cooperate with Scott County in its implementation of its Groundwater Plan • Promote infiltration practices	1, 3, 4, 11, 12, 13	• Implement new water quality and volume management rules and standards • Work with county to take groundwater balance considerations into account in implementing new volume management standards or projects • Partner with county to implement regional infiltration projects • Encourage adoption of Low Impact Development design principles and other BMPs that increase on-site infiltration • Work with SWCD to identify potential agricultural BMPs actions that would positively impact groundwater
17. Wetland mitigation generally occurs outside the watershed	• Work with MOA permitting partners and LGUs to ensure priority order of wetland replacement siting is followed • Investigate potential for one or more local wetland banks	4, 6, 11, 12	• Ensure that priority order of wetland replacement siting is followed in the wetland permitting process • Investigate potential for and encourage creation of local wetland banks

Problem	General Solutions	Goals	Actions
18. Need to identify and protect high-value wetlands and other natural resources important to water quality	• Identify high-value resources and methods for their protection	1, 3, 4, 6, 8, 10, 11, 12, 13	• District collaborate with LGUs and lead an effort to complete a wetland functional assessment and values survey • Within 2 years develop a plan identifying high priority wetland areas for protection and management • District lead effort to identify high-quality natural resources important to water quality in their local plans • Incentive-based and regulatory options will be used to ensure wetland quality and function is preserved in the Watershed • Budget and set aside funding for land acquisition or conservation easement
19. District owns and operates water quality and stormwater conveyance facilities	• Perform operations and maintenance as required and in accordance with NPDES permit	2, 4, 6, 7, 9, 10, 13	• Perform operations and maintenance as required and in accordance with NPDES permit
20. Distributed water quality and volume management practices require maintenance to maintain design efficiency	• Require LGUs to include in their local plans a plan to ensure that periodic inspections, maintenance, and improvement of water quality, volume management, and vegetative buffers are completed	1, 3, 4, 5, 6, 7, 8,	• Require LGUs to include in their local plans a plan to ensure that periodic inspections, maintenance, and improvement of water quality, volume management, and vegetative buffers are completed
21. Zebra mussels found in Prior Lake	• Address and manage the issue in cooperation with partners and under the leadership of the DNR	3,4,5, 6, 10	• Work together with the DNR and other partners to identify extent of the problem and potential management strategies as information and funding become available

SECTION 4 - IMPLEMENTATION PLAN

4.1 INTRODUCTION

This section of the management plan details the specific activities the District expects to undertake to work toward achieving the goals enumerated in Section 2 and implementing the management strategies in Section 3. These activities include capital projects, operating and management programs, and regulatory activities as well as potential partnership activities with other jurisdictions such as cities, the county, and the SWCD. These activities are discussed below and tabulated in Table 4.1 along with their estimated cost and staff time commitment.

It is important to bear in mind the following when reviewing the Implementation Plan:

1. Implementation actions tabulated are those of high enough priority to be considered by the Board of Managers during the planning period. At a minimum, the capital improvements are subject to the Managers' biennial review at which time each proposed action will be reviewed, projects may be deleted, and projects may be added by major or minor amendment. This first review should occur prior to budget discussions associated with year 2014 expenditures. The biennial review process is further bolstered by the Managers' philosophy (see 2.4.1.4 of this plan), and the statutory requirement per 103B.251, to hold public meetings prior to ordering any individual capital improvement.
2. It is obvious that the District has an administrative need to forecast potential expenditures. Less obvious is the role of Scott County in this process. The County plays a major role in collecting taxes levied by the District. Minnesota Statutes allow for the County to specifically approve capital projects (when such projects are added to the CIP in the District's Plan) in recognition of this role and to facilitate forecasting of bonding needs.
3. Some of the implementation actions tabulated in Table 4.1 are "placeholder projects" that will require further study, definition and refinement to provide the level of detail necessary for the County, the public, as well as the Managers prior to ordering projects. For example, future lake TMDL implementation will likely require implementation activities, but the specific activities are as of yet unknown. These placeholder projects identify the general type of activity and expenditure level, and provide the Managers with flexibility to be responsive to opportunities that may not be known in detail at this time. As described above, it is the Managers' policy to undertake a full public review prior to undertaking any specific project, so that when these opportunities do occur the District can be responsive while still providing adequate opportunity for public comment and review. The District anticipates that minor plan amendments will likely be required every year, as new projects are identified and projects in Table 4.1 are filled out and clarified.
4. Some of the projects or activities in Table 4.1 require initial Feasibility Reports that explore additional alternatives and that refine project cost.

5. The District is currently constrained by low tax capacity due to a lack of significant commercial and industrial properties. The existing tax capacity of the District was used to project the financial impact of various District expenditures on several typical residential valuations. These are tabulated in Section 5 under the Programs and Project Funding section.
6. Nearly all capital project expenditures will be funded utilizing Minnesota Statutes 103B.241. Both 103B.241 and JPA/MOA cost share funding may be used for the Outlet Channel. This is consistent with the goals and policies of the Managers outlined in Section 2.
7. Additional financial resources will occasionally become available as they are pursued by the Board of Managers. These may include grants, donations, in-kind services, participation by other governmental units, and possibly the utilization of subwatershed taxing districts or assessments when project scope expansion would result in greatly localized benefits, such as near shore treatment of Curlyleaf pondweed on District lakes. The District has had success obtaining outside grant dollars in recent years. This has reduced the financial burden carried by the District. Costs tabulated in Table 4.1 cannot anticipate the amount of grant dollars that could potentially be utilized to defray project costs.

4.2 IMPLEMENTATION PLAN

The areas of concern identified in the watershed management problem identification process were a culmination of meetings and discussions with a Technical Advisory Committee, interested citizens, representatives of local groups and the District Board of Managers. This provided the framework for the issues to be addressed as part of the strategic implementation plan. While the majority of the problems and issues raised have centered on the Prior Lake outlet system, volume control and development, additional issues such as TMDL implementation, wetland management, maintenance concerns, public information, and other management areas were identified and incorporated into the Implementation Plan. Future implementation items will be identified through strategies such as board workshops, joint meetings with LGUs, review of road authority CIPs, lake reconnaissance plans, modeling, landowner visits and CAC/TAC input.

The District's Implementation Plan includes operations and management activities ("nonstructural solutions") as well as capital projects ("structural solutions") to address these problems and issues and progress toward the District's various goals. Capital projects can be initiated in a number of ways, including by staff and Board identification; by partners such as local governments proposing cost-share projects; or by petition in accordance with State Statute 103D.705.

The District maintains a standing Technical Advisory Committee of city, township, county, SWCD, and other interested parties, and will continue to rely on that TAC for technical review and input during Plan implementation. The District also has a Citizens Advisory Committee that periodically convenes to obtain review and advice from community stakeholders for special topics such as the TMDL projects, this Management Plan and lake management plans. The Board will continue that practice as this Plan is implemented.

The Board of Managers may establish cost-share programs as part of this Implementation Plan. Annual funding for those programs will be set through the annual budget process. Specific awards will be made by the Board of Managers in accordance with criteria and procedures established for each program, but in general will relate to public value, cost-benefit, and location within an area for targeted improvement as identified in TMDLs and the various other modeling efforts previously completed by the District. The District will post annually to the District website, the target outcomes (or focus) of each cost-share program and selection criteria in which decisions are based. Said criteria are likely to include:

- Volume, Nutrient & TSS Load Reduction(s)
- Quality of Receiving Waterbody
- Cost Effectiveness
- Wildlife Habitat Improvement
- Innovation
- Collaboration
- Public Outreach / Education

Additionally, in implementing its cost-share programs, the District will follow a set of steps to benefit from input from public agencies, watershed residents, and other interested parties.

1. The overall program funding level will be set annually through the District's budgeting process. This is an open process that occurs in August and early September each year, and includes a public hearing required by statute at which all parties can review and address the Board of Managers on the District's proposed program budget.
2. The District will follow the procedures identified in this Plan for biennial review of its implementation priorities. Every other year, as a part of this review, the District will conduct public hearings with prior published notice and written notice to the county and all local cities and townships within the watershed. The Board will hear and consider all public comments and make plan implementation and funding decisions in an open public meeting.
3. Cost-share funding proposals will be processed and evaluated according to a written set of guidelines adopted by the Board of Managers for each program. The primary purposes of these guidelines are to a) provide for consistency in District review and selection of proposals for funding; b) direct District funds to projects and locations that will further the goals and priorities of the watershed plan in an effective manner and are supported by modeling or other inventories or analysis; c) ensure that funding is formalized in a grant agreement that guarantees project completion and maintenance. The Board may review these terms from time to time, but any revisions will not deviate from the three purposes cited.
4. When a portion of cost-share funding is intended to be applied to capital construction, the District will follow procedures under State Statutes 103B.251 for project-specific public and Board of Managers review before authorizing any use of funding for design or construction.

For purposes of presenting the management strategies and highlighting their effectiveness for particular areas of the watershed, they have been grouped by project type, utilizing the same divisions in the Policies section. In addition, included with each management strategy is an indication of which of the four major subwatershed divisions they are most likely to affect. These subwatershed areas are shown in the Subwatershed map in Appendix B.

The **Outlet Subwatershed** addresses all areas downstream of the Prior Lake outlet, including Pike Lake. These areas are generally located to the northwest of Prior Lake and encompass the areas west of County Road 21 and north of County Road 42. Portions of this subwatershed extend beyond the District's political boundary due to the nature of the outlet channel crossing through the City of Shakopee and into the Lower Minnesota River Watershed District.

The **Prior Lake Subwatershed** includes all areas tributary to Prior Lake exclusive of the Spring Lake outlet channel flowage. This is the most heavily developed portion of the District and contains a large number of storm sewers and homes adjacent to floodplain.

The **Spring Lake Subwatershed** includes all areas tributary to the outlet of Spring Lake, including the upper watershed.

The **Upper Watershed** is a subset of the Spring Lake subwatershed, and is generally defined as the agricultural and low-density developed area upstream of the direct drainage area of Spring Lake. This subwatershed has been targeted in the water quality studies of the District and is primarily rural in nature.

The Implementation Plan is described in the narrative below and in tabular form on Table 4.1. Table 4.1 also identifies the management goals identified in section 2 that are addressed by each proposed action. Projects and activities are shown in detail for 2010-2019.

The need for each project and the scope of the project is discussed in the narrative section. The box on the right summarizes the planned expenditures in thousands of dollars, the sources of funding (which may include the District's *ad valorem* levy on all property within the District or other levy authorities under Minnesota Statutes Chapter 103B.251, grant opportunities from state, federal, or other entities, and alternative sources including loans and cost sharing from other sources), and the watersheds affected by the project.

Some projects are considered "unfunded". These projects have their expenses ~~struck-through~~ in the narrative section, and are struck through in Table 4.1. They are projects that the District does not intend to explore or fund at the present time, but may fund if circumstances or revenue sources change. Costs for these projects should not be included in totals.

4.2.1 Capital Projects

Capital projects are generally large, expensive projects that cannot be funded easily with one of the existing implementation mechanisms, such as the cost-share framework. The District will seek to implement these projects in partnership with local entities where possible, and seek grant funding, again where possible. The District is prepared to contribute at least 25% of the estimated cost of the planned expenditures in this section, regardless of the outcome of grant applications. Each individual project is intended to significantly advance a goal or goals of the District.

All capital projects will be preceded by a study to determine their feasibility, either as part of a greater study (such as a TMDL study), or in the preceding year as a separate expenditure (see 4.2.3.5 – Feasibility Reports). The Board may choose not to fund planned capital expenditures if the outcome of the feasibility report is unfavorable.

4.2.1.1 Public Infrastructure Partnership Projects

Funding

Amounts ($1,000)	
2010	50
2011	50
2012	50
2013	75
2014	75
2015	75
2016	75
2017	75
2018	75
2019	75
Total	*675*

Sources	
Tax	X
Grant	X
Other	X

Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	

Need: The Volume Management Plan and the Spring Lake-Upper Prior Lake nutrient TMDL identify the need to reduce runoff to the lakes, to reduce pollutant loading and to help manage the restricted outlet from Prior Lake.

Scope: One strategy to reduce runoff to the lakes is to retrofit streets, highways, and other public infrastructure with volume management and load reduction BMPs on routine street, highway, and other reconstruction projects. The City of Prior Lake has identified a number of opportunities on upcoming city improvement projects where is may be possible to retrofit BMPs and achieve significant and cost-effective new water quality treatment and volume reduction. The District may consider cost sharing with the City on some of these improvements. These funds may also be used as match to grants from other sources. Other public entities with which the District may consider partnering on infrastructure upgrades include the cities of Savage and Shakopee, Scott County, and the Shakopee Mdewakanton Sioux Community; Scott County has expressed an interest in partnering with the District in 2014 on possible stormwater retrofits to their public works facility.

Potential project areas identified with local partners and the estimated year of implementation are:

	2014
Prior Lake	Stemmer Ridge, Mushtown, Maple, Panama, Carriage Hills, Franklin Trail street reconstruction
Scott County	Public Works Stormwater Retrofit
	2015
Prior Lake	Downtown South Maplewood, Grainwood, Eau Claire, Albany, Highland, Marsh, Skyline, Crest Avenue street reconstruction
	2016
	2017
Prior Lake	Balsam, Sunrise, Manitou street reconstruction

Additional possible joint projects with the City of Prior Lake to be undertaken within the 2014-2019 planning period are:

- Homeowners association irrigation systems are six of the top 10 largest water users in the City of Prior Lake. The City is undertaking test trials of automated irrigation sprinkler systems, using smart controls and sensors to reduce water usage and over watering, and if substantial reductions can be made wishes to provide financial incentives to large water users to adopt these automated systems to conserve groundwater.
- A demonstration project to evaluate alternative turf options for highway and other road medians and boulevards to improve water quality and infiltration benefits and reduce maintenance of these high-failure areas.

As opportunities become available, the District will use the following questions to determine whether proposed projects eligible for funding or cost sharing:

- How much phosphorus pollution or water volume does the project prevent from entering lakes, particularly impaired lakes or lakes in the TMDL program?
- What is the cost per pound of phosphorus or acre-foot of water volume, and how does it compare to other, similar projects the District has funded?
- To what degree does the project address other goals of the District, such as education or ecosystem restoration?
- What is the level of commitment on the part of the partner organization to the project (monetary commitment and/or staff time)?
- Is there a firm plan for maintaining the project construction (if applicable)?

4.2.1.2 Storage and Infiltration Projects

Funding

Amounts ($1,000)	
2010	35
2011	35
2012	35
2013	35
2014	35
2015	35
2016	35
2017	35
2018	35
2019	35
Total	*350*

Sources	
Tax	X
Grant	X
Other	X

Watersheds	
Upper	X
Spring	
Prior	
Outlet	

Need: Both the District's Volume Management Study and the Spring Lake-Upper Prior Lake nutrient TMDL identify the need to reduce runoff to Spring and Prior Lakes. The restricted outlet on Prior Lake requires that new runoff volumes be limited, while the TMDL identified the need to reduce pollutant loading from the watershed through the implementation of small Best Management Practices.

Scope: The District will undertake or cost-share in projects to reduce runoff, increase infiltration, and reduce pollutant loading and transport directly to Prior Lake, potentially partnering with the City of Prior Lake on a program to provide financial incentives to homeowners to install and maintain rain gardens on their property. These funds may also be used as match to grants from other sources. In 2010, the District began landowner outreach and conduct feasibility assessments on regional basins identified in the District's 2004 Storage and Infiltration Study.

The Volume Management Study identified the need to increase storage or decrease runoff in the Upper Watershed by 1,500-3,000 acre-feet annually. As noted above, various studies at the District and County level have preliminarily identified potential locations for storage and infiltration basins. The District has partnered with Scott SWCD and will work with Spring Lake Township to do an in depth analysis of the township's Low Impact Development (LID) land use plan and determine at what level the plan helps to achieve the District's volume management goals. This analysis will assist in determining volume reduction targets for the balance of the Upper Watershed. The District will undertake or cost-share in projects to reduce runoff and increase infiltration and abstraction in the Upper Watershed. These funds may also be used as match to grants from other sources. In 2012-2013 the County Road 12/17 wetland restoration project is included in this program.

4.2.1.3 Identify and Mitigate Channel Erosion

Need: As development occurs in the Upper Watershed, additional runoff volume may increase erosion in County Ditch 13 or the small channels that drain the Upper Watershed.

Scope: The District and the Scott SWCD will periodically monitor channels for signs of erosion and where erosion is occurring, identify options and implement stabilization projects. The District will work with Scott SWCD to complete restoration on erosion currently identified immediately north of 190th Street.

Erosion sites may occur spontaneously after writing this plan, and therefore cannot be entirely anticipated in advance. Priority will be given to the most serious erosion sites, meaning those with the greatest potential to deliver sediment to a downstream water resource of concern (public water or wetland, where wetland protection has been prioritized by the 2012 Wetland Management Plan).

Funding

	Amounts ($1,000)
2010	4
2011	4
2012	4
2013	4
2014	4
2015	4
2016	4
2017	4
2018	4
2019	4
Total	*40*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	
Prior	
Outlet	

4.2.1.4 Upper Prior BMP Retrofit

Need: The Spring Lake-Upper Prior Lake Nutrient TMDL identified significant phosphorus watershed load to Upper Prior Lake. Controlling watershed load is necessary to improve water quality and clarity in Upper Prior Lake.

Scope: The District obtained a grant from the Board of Water and Soil Resources to identify and implement upgrades to the storm sewer infrastructure in the immediate drainage area to Upper Prior Lake. As of winter 2012 those projects have been installed. The District will continue to monitor them.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	42
2013	0
2014	0
2015	0
2016	0
2017	0
2018	0
2019	0
Total	*42*

Sources	
Tax	X
Grant	X
Other	

Watersheds

Upper Spring	
Prior	X
Outlet	

4.2.1.5 Spring Lake Internal Load Management Project

Need: The Spring Lake-Upper Prior Lake Nutrient TMDL identified internal load as a significant source of phosphorus to Spring Lake. Controlling internal load is necessary to improve water quality and clarity in Spring Lake.

Scope: The reduction of internal pollutant loading through one or more internal load management projects is identified as an important strategy in the improvement of water quality in Spring Lake. Such internal load projects might include options such as chemical treatment, aeration, hypolimnetic withdrawal, or biological manipulation. The District has conducted a feasibility study for application of aluminum sulfate and created a dosing rate map for Spring Lake. The proposed alum application would be split into three applications, with half of the material applied in the first year, on fourth three years later, and the final fourth three years after that. The District has also conducted sediment core sampling to determine historic loading levels and will use the results to better guide project and treatment decisions.

The District is currently engaged in a public outreach campaign to gather input from all stakeholders prior to deciding whether to implement the proposed alum application, and what timing would be appropriate. The central question the Board will consider is whether additional external load should be controlled before applying alum to the lake

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	25
2013	500
2014	0
2015	5
2016	250
2017	0
2018	5
2019	250
Total	*1,035*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper Spring	X
Prior	X
Outlet	

The 2013 budget included $300,000 for an alum application, short of the $500,000 required for the initial application. Options the District will consider include bonding for the remainder, asking local partners to help pay for the shortfall, or delaying the project until sufficient capital has been acquired.

4.2.1.6 Upper Prior Lake Internal Load Management Project

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	0
2017	0
2018	0
2019	450
Total	*450*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper Spring	
Prior	X
Outlet	

Need: With upstream treatment of Spring Lake with alum to reduce internal nutrient loading, lower concentrations of phosphorus are reaching Upper Prior Lake. However, as past studies have indicated, there is still an internal reservoir of phosphorus in Upper Prior Lake that continues to hinder the improvement of water quality in the Lake. Water quality data collected from 2002 to 2015 shows that average annual surface water phosphorus and chlorophyll-a concentrations are decreasing; however, summertime spikes in phosphorus and chlorophyll-a concentrations are still noted annually which are correlated with algae blooms and perceived poor water quality. These seasonal trends are heavily correlated with loads derived from internal sources including loads derived from the release of phosphorus from the sediment in areas of the lake that go anoxic during the summer.

Scope: The Upper Prior Lake In-Lake Phosphorus Management Plan identified several potential sediment phosphorus management options most applicable to Upper Prior Lake, including a customized alum application. A weight of evidence approach was used to provide the background information needed to clearly identify two distinct treatment zones with different concentrations in observed releasable phosphorus (RP) content. Treatment zone 1 (230 acres) requires the application of 384,000 gallons of alum at an average alum dosing rate of 1,670 gallons per acre. Treatment zone 2 (43 acres) requires the application of 78,000 gallons of alum at an average alum dosing rate of 1,800 gallons per acre (462,000 gallons total). The average alum dosing rates are reflective of observed RP concentrations in each Treatment zone. The total dose will be split into two applications to address future contributions from the breakdown of labile organic phosphorus; controlling labile phosphorus represents a commitment to extending the life expectancy of the alum treatment. This project includes funding for the first of the two planned alum dosing applications.

The District has set aside $90,000 to meet the 25% cash match requirement for BWSR Clean Water Fund (CWF) Grants. The District will apply for BWSR CWF dollars in the fall of 2018 to offset the remaining costs of an alum treatment to be conducted in 2019.

4.2.1.7 CD 13 Ferric Chloride Redesign

Need: The District has been in dialogue with the MPCA concerning renewal of the five-year operating permit for the existing $FeCl_3$ facility installed on the County Ditch 13 channel immediately south of Highway 13. The MPCA has advised that it will not be able to reissue a permit because the facility design, dating from 1998, no longer meets federal and state regulations that limit the use of natural or altered channels as a place of mixing for chemical treatment systems. The MPCA is allowing the District to operate under a continuation of its prior permit but a redesign of the facility will be necessary for the facility to continue to operate beyond the 2012-2013 time period.

Scope: The District has nearly completed reconstruction of the $FeCl_3$ facility. All work has been budgeted for and permitted, and completion is anticipated in early summer of 2013, at which point operation of the facility will resume. A revised operation and maintenance manual that includes a revised rating curve will also be created in early summer 2013.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	255
2014	0
2015	0
2016	0
2017	0
2018	0
2019	0
Total	*255*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	
Outlet	

4.2.1.8 County Roads 12 and 17 Wetland Restoration

Need: Both the District's Volume Management Study and the Spring Lake-Upper Prior Lake nutrient TMDL identified the need to reduce runoff to Spring and Prior Lakes. The restricted outlet on Prior Lake requires that new runoff volumes be limited, while the TMDL identified the need to reduce pollutant loading from the watershed.

Scope: Scott County plans to reconstruct a segment of County Road 12. This reconstruction presents an opportunity to partner with the County and the City of Prior Lake on a wetland restoration at the intersections of 12 and 17. This restoration will create significant water storage volume above and beyond the regulatory requirements for the road reconstruction. It will also slow the water down through the area, increasing contact time and potential phosphorus absorption and evapotranspiration by plants.

The District has worked with Scott County and the City of Prior Lake to secure funding for this project, and the partners have created a design that will meet the objectives of all the organizations. The District has also worked with BWSR to ensure that existing grant funding can be utilized for the project. Construction on the project is anticipated in late summer of 2013.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	80
2014	180
2015	0
2016	0
2017	0
2018	0
2019	0
Total	*260*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper Spring	X
Prior	
Outlet	

4.2.1.9 Buck Lake Channel Chemical Treatment System

Need: The Spring Lake-Upper Prior Lake Nutrient TMDL identified a 3,800 lb. of phosphorus per year watershed load to Spring Lake. Controlling watershed load is necessary to improve water quality and clarity in Spring Lake.

Scope: Studies of the $FeCl_3$ system downstream of County Ditch 13 have shown it to be a cost effective means of removing a large quantity of phosphorus from a stream before it can be deposited into a lake. Monitoring of the Buck Lake channel indicates that in some ways it may be a better candidate for a chemical system than the County Ditch 13 system. Much of the phosphorus in the Buck Lake channel is dissolved, which cannot be precipitated out via traditional settling, but is susceptible to flocculation/chemical treatment; in addition, the flows through the system are more regular, potentially indicating a wider window of treatment most years.

This project will install an Alum or $FeCl_3$ system to treat most of the flows through the Buck Lake Channel, downstream of Buck Lake and upstream of the Ducks Unlimited channel. The proposed treatment system would be offline, meaning all treatment would occur outside of the regular flow of water, to comply with MPCA regulations. Feasibility work has begun on this project, and is anticipated to be completed in fall of 2013. The District will be applying for grant funding for this project.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	60
2014	140
2015	280
2016	0
2017	0
2018	0
2019	0
Total	*480*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper	X
Spring	X
Prior	
Outlet	

4.2.1.10 Spring Lake Outlet Channel Easement Acquisition

Need: The outlet of Spring Lake serves a vital hydrologic function. In the past floating bogs have clogged the channel, creating high water conditions around Spring Lake.

Scope: South of County Highway 12 / Spring Lake Road there are three landowners along the outlet of Spring Lake. In the past, when floating bogs have plugged the channel, the District has been expected to respond to the situation; however, lack of access rights has made it difficult to respond in a timely manner. The District will work with these landowners to both acquire the right to access the mouth of the outlet during an emergency, and install whatever facilities may be necessary to increase the acceptable response time in the event of a clogging, such as stones or another structure to keep vegetation from fully blocking the outlet. In addition, the District will install facilities to minimize damage to property along the access route during an event.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	30
2014	0
2015	0
2016	0
2017	0
2018	0
2019	0
Total	*30*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper Spring	X
Prior	X
Outlet	

4.2.1.11 Spring Lake Outlet Channel Restoration

Need: The outlet of Spring Lake is unstable and may be depositing sediment and phosphorus into Upper Prior Lake.

Scope: Most of the length of the Spring Lake outlet channel is owned by private landowners, and is in varying states of maintenance and stability. The District worked with two landowners to stabilize a section of the channel in 2012; however, further landowner outreach could result in a channel that is more stable and less likely to contribute sediment and phosphorus to Upper Prior Lake. The District will work with landowners to install stabilization measures, such as the cedar tree revetment already installed, along the length of the channel.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	50
2016	50
2017	0
2018	0
2019	0
Total	*100*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper Spring	X
Prior Outlet	X

4.2.1.12 Lower Prior Lake Retrofit BMP Study and Projects

Need: The 2012 Lower Prior Lake Diagnostic Study set water quality targets for Lower Prior lake and identified projects to meet those targets.

Scope: In 2011 the District pursued and was awarded a Clean Water grant from the MPCA. This grant included a budget of $96,000 for a diagnostic report and implementation plan for Lower Prior Lake. As of late spring 2013 the diagnostic report including detailed in-lake and stream monitoring and analysis of collected data, has been completed and submitted to the MPCA for final approval.

The District will utilize the report to prioritize potential retrofit stormwater management BMPs within the Lower Prior Lake subwatershed for subsequent implementation, either in partnership with the City of Prior Lake or directly with landowners. In addition, the District may choose to pursue another Clean Water grant from the MPCA on the basis of the conclusions and recommended actions in the 2013 report. Implementation of this plan will focus strongly on education programs, such as lawn management and promotion of shoreline buffers. The implementation plan also identifies specific projects on City of Prior Lake lands that the District and the City may implement together, and numerous potential raingarden locations.

Funding

	Amounts ($1,000)
2010	0
2011	39
2012	56
2013	25
2014	25
2015	25
2016	25
2017	25
2018	25
2019	25
Total	*270*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper Spring	
Prior	X
Outlet	

4.2.1.13 County Ditch 13 In-Line or Parallel Treatment

Need: The Spring Lake-Upper Prior Lake Nutrient TMDL identified a 3,800 lb. of phosphorus per year watershed load to Spring Lake. Controlling watershed load is necessary to improve water quality and clarity in Spring Lake.

Scope: Approximately 40% of the watershed phosphorus load to Spring Lake comes through the County Ditch 13 system. While the District operates the $FeCl_3$ system which effectively removes a significant percentage (approximately 30%) of the incoming P load, and is planning modifications that should increase the efficiency of that system, the majority of phosphorus that reaches the $FeCl_3$ system passes through to Spring Lake. With this project the District will look upstream and implement projects to remove phosphorus before it crosses Highway 13, creating a more effective treatment train.

The targeted practices will be small footprint devices that can fit in an area not much larger than an existing channel cross section. St. Anthony Falls Laboratory is a potential partner on this project, as they are developing small-footprint, in-channel devices that both filter particles and trap dissolved phosphorus, such as removable steel wool filters and textile-wrapped iron-sand filters between small rock weirs or ditch checks. Diverting flow out of the channel to other BMPs such as sand-iron filters will be explored as well.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	0
2017	150
2018	0
2019	0
Total	*150*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper Spring Prior Outlet	X

4.2.1.14 Arctic Lake Restoration

Need: Arctic Lake does not meet statewide water quality standards. The Spring Lake-Upper Prior Lake Nutrient TMDL identified a need to reduce phosphorus loading to Upper Prior Lake, and Arctic Lake contributes phosphorus to the lake. Arctic Lake, as it is hydrologically connected to Upper Prior, may function as a breeding ground for invasive species.

Scope: The Shakopee Mdewakanton Sioux Community, the City of Prior Lake, and the District are currently collaborating on a diagnostic study of Arctic Lake, with completion anticipated in mid-summer 2013. The goal of the SMSC is to utilize the study to conduct a complete restoration of the lake, including pollutant loading and aquatic life. The District will partner with the SMSC and the City of Prior Lake in this effort, which will provide the following benefits:

- Reduction in phosphorus loading to and from Arctic Lake, which will contribute to improved water quality conditions in Prior Lake.
- Reduction or elimination of invasive species in Arctic Lake, including carp, curlyleaf pondweed, and possibly others. This would also prevent Arctic from spreading these species to Prior Lake and other waterbodies.
- Creation of a "blueprint" for restoration of other lakes within the District.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	100
2015	0
2016	0
2017	0
2018	0
2019	0
Total	*100*

Sources	
Tax	X
Grant	X
Other	X

Watersheds	
Upper Spring	
Prior	X
Outlet	

Individual projects have not yet been identified, but are likely to include modification of wetland, stormwater pond, and lake outlet structures, stabilization of gullies, and possibly in-lake treatment options such as draw-downs, carp removal, and possibly alum application to reduce anoxic phosphorus release. The District will decide which to pursue based on the estimated magnitude of the beneficial impact on water quality. Funding for these projects will likely be split between the project partners, and is anticipated to include grant funding from the EPA and BWSR.

4.2.1.15 Biological Nutrient Removal

Need: The Spring Lake-Upper Prior Lake Nutrient TMDL identified a 3,800 lb. of phosphorus per year watershed load to Spring Lake. Controlling watershed load is necessary to improve water quality and clarity in Spring Lake.

Scope: The District has successfully implemented a system for chemically removing phosphorus from streams tributary to Spring Lake, and in this plan proposes installing another. There is evidence that at certain concentrations of phosphorus a biological system, utilizing a carefully balanced bacterial culture or set of cultures, can be more cost-effective at removing phosphorus than a chemical-based system. The District will retrofit existing and planned chemical systems with biological systems, and take advantage of the small footprint of biological systems to install treatment where none has been possible before.

The first element of this project will be a report on existing & proposed chemical treatment systems in the District, with a priority list of which could be improved through use of biological nutrient removal techniques. Implementation will be based on which retrofits or projects will have the lowest cost per pound of phosphorus removed.

This project is *unfunded*. The District does not plan to actively pursue, levy for, or allocate funding toward this project unless a significant source of funding becomes available, there is a significant increase in interest in the project from local stakeholders, or the District understanding of how this technology could be utilized improves.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	~~300~~
2016	0
2017	0
2018	0
2019	0
Total	~~*300*~~

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper	X
Spring	X
Prior	
Outlet	

4.2.1.16 Implement Fish Lake TMDL

Need: Fish Lake is impaired for nutrients. The District plans to lead the Fish Lake TMDL and Implementation Plan (4.2.3.7), which will identify a number of activities to improve water quality in the lake, some of which will be undertaken by local governments and some by the District.

Scope: The TMDL study is scheduled to begin in 2018. It is expected that, due to the predominance of loading from within the lake, the primary recommended course of action will be internal load management, such as alum treatment, hypolimnetic withdrawal, or aeration. Other secondary activities may include but not be limited to the following:

- Aquatic vegetation management.
- Rough fish management.
- Land or easement acquisition in critical areas.
- Load reduction BMPs such as bioinfiltration basins, vegetated swales, stormwater ponds, and treatment devices.
- Load reduction BMPs such as buffer strips, nutrient reduction or manure management plans, promotion of conservation tillage, and cost-sharing in Federal, State, and local financial incentive programs for agricultural BMPs such as EQIP and CREP.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	0
2017	0
2018	0
2019	25
Total	*25*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper	X
Spring	
Prior	
Outlet	

Some of these types of activities may be funded under other District programs, such as the cost-share docket with the Scott SWCD, or some activities may be new, standalone programs or projects that fall outside of existing programs. Some of the funding identified for this Implementation Plan may be reallocated to existing programs so that those activities can be targeted to the Fish Lake subwatershed. These funds may also be used as match to grants from other sources. When the TMDL and the TMDL Implementation Plan are completed the District will incorporate items from the Implementation Plan into the Water Resources Management Plan, assessing whether Implementation activities can be undertaken within the existing budget and capital implement program or whether a plan amendment is necessary.

4.2.1.17 Implement Pike Lake TMDL

Need: Pike Lake is impaired for nutrients. The District plans to lead the Pike Lake TMDL and Implementation Plan (4.2.3.6), which will identify a number of activities to improve water quality in the lake, some of which will be undertaken by local governments and some by the District.

Scope: The TMDL has not yet been completed, but it is expected that activities will include but not be limited to the following:

- Internal load management, such as alum treatment, hypolimnetic withdrawal, or aeration.
- Aquatic vegetation management.
- Rough fish management.
- Land or easement acquisition in critical areas.
- Load reduction BMPs such as bioinfiltration basins, vegetated swales, stormwater ponds, and treatment devices.
- Load reduction BMPs such as buffer strips, nutrient reduction or manure management plans, promotion of conservation tillage, and cost-sharing in Federal, State, and local financial incentive programs for agricultural BMPs such as EQIP and CREP.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	0
2017	0
2018	0
2019	25
Total	*25*

Sources	
Tax	X
Grant	X
Other	X

Watersheds	
Upper Spring Prior	
Outlet	X

Some of these types of activities may be funded under other District programs, such as the cost-share program, or some activities may be new, standalone programs or projects that fall outside of existing programs. Some of the funding identified for this Implementation Plan may be reallocated to existing programs so that those activities can be targeted to the Pike Lake subwatershed. These funds may also be used as match to grants from other sources. When the TMDL and the TMDL Implementation Plan are completed the District will incorporate items from the Implementation Plan into the Water Resources Management Plan, assessing whether Implementation activities can be undertaken within the existing budget and capital implement program or whether a plan amendment is necessary.

4.2.1.18 Buck Lake Channel and Lake Restoration

Need: Both the District's Volume Management Study and the Spring Lake-Upper Prior Lake nutrient TMDL identify the need to reduce runoff to Spring and Prior Lakes. The restricted outlet on Prior Lake requires that new runoff volumes be limited, while the TMDL identified the need to reduce pollutant loading from the watershed.

Scope: The District will modify portions of the Buck Lake channel to accommodate regional storage and infiltration, and consider constructing one or more projects in cooperation with local partners. Projects to be considered will include manipulation of wetland hydrology, stream bank restoration, and vegetative restoration, among others. Spring Lake Township has identified the Buck Lake Channel as a greenway, and the District will explore and implement options to accomplish water quality improvements, storage and infiltration, habitat preservation and creation, and recreation improvements in cooperation with the Township.

Prior to completion of a project a Feasibility Study would explore viable options and identify the most cost-effective option(s). Scott County Planning and Zoning and Spring Lake Township will be key partners in this effort. Projects that do the most to address the District's goals will be given priority. Given the greenway designation of the Buck Lake corridor, the District will make a particular effort to pursue grants and joint funding with partners.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	60
2016	60
2017	60
2018	60
2019	60
Total	*300*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper	X
Spring	
Prior	
Outlet	

4.2.1.19 Buck Lake Dredge

Need: Both the District's Volume Management Study and the Spring Lake-Upper Prior Lake nutrient TMDL identify the need to reduce runoff to Spring and Prior Lakes. The restricted outlet on Prior Lake requires that new runoff volumes be limited, while the TMDL identified the need to reduce pollutant loading from the watershed.

Scope: Buck Lake has accumulated a significant volume of sediment from agriculture, bank failures, and other sources of erosion. This accumulated sediment serves as a potential source of phosphorus and reduces the quality of water in the lake. The District will remove most of the sediment that has built up since the area was settled by Europeans in the 1850s, restoring volume and reducing potential phosphorus loading downstream.

The District acknowledges that the DNR has the final say over approving dredging in public waters, and that it may not approve the proposed project. Close collaboration with the DNR will be a key element of the feasibility stage of this project.

This project is *unfunded*. The District does not plan to actively pursue, levy for, or allocate funding toward this project unless a significant source of funding becomes available or there is a significant increase in interest in the project from local stakeholders.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	~~2,100~~
2017	0
2018	0
2019	0
Total	~~*2,100*~~

Sources	
Tax	X
Grant	X
Other	X

Watersheds	
Upper	X
Spring	
Prior	
Outlet	

4.2.1.20 Ducks Unlimited Weir/BMP

Need: Both the District's Volume Management Study and the Spring Lake-Upper Prior Lake nutrient TMDL identified the need to reduce runoff to Spring and Prior Lakes. The restricted outlet on Prior Lake requires that new runoff volumes be limited, while the TMDL identified the need to reduce pollutant loading from the watershed.

Scope: The last stop before reaching Spring Lake for water coming through the Buck Lake channel system is the Ducks Unlimited wetland, located just north of the intersection of Highway 13 and 180th Street. The wetland empties into Spring Lake through a small passage that is occasionally blocked by beavers. The District will evaluate and implement a best management practice, potentially a weir, which will manage the water in the wetland to the benefit of both the wetland and Spring Lake.

The District acknowledges that the DNR has the final say over approving modifications to public water outlets, and that it may not approve the proposed modification. Close collaboration with the DNR will be a key element of the feasibility stage of this project (see 4.2.3.5 – Feasibility Reports). In addition, the District has examined the possibility of modifying the Ducks Unlimited wetland in the past; documentation of these attempts will be examined in detail before moving forward with a feasibility study.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	150
2017	0
2018	0
2019	0
Total	*150*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper Spring	X
Prior Outlet	

4.2.1.21 Fish Lake Internal Load Management

Need: Fish Lake is impaired for nutrients. A TMDL study is scheduled for 2018.

Scope: Previous studies of Fish Lake have indicated that nearly all of the phosphorus loading to the lake is internal. The lake also has a very small watershed relative to lake size. This makes it an ideal candidate for internal load management. The District will investigate options for internal load management, such as application of alum, biomanipulation, and others, and will implement the recommended course of action. Application of alum will be contingent upon completion of a study to determine whether external sources must be controlled first. The April 2006 Sustainable Lake Management Plan for Fish Lake includes an appendix with multiple estimates of the internal phosphorus load of Fish Lake; that work will be incorporated into any feasibility study of internal load management.

The District will investigate multiple potential sources of funding for this project, including grants, funding from local partners, and potentially bond issuance.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	0
2017	300
2018	0
2019	0
Total	*300*

	Sources
Tax	X
Grant	X
Other	X

Watersheds

Upper	X
Spring	
Prior	
Outlet	

4.2.1.22 CD-13 Wetland Dredge

Need: Both the District's Volume Management Study and the Spring Lake-Upper Prior Lake nutrient TMDL identify the need to reduce runoff to Spring and Prior Lakes. The restricted outlet on Prior Lake requires that new runoff volumes be limited, while the TMDL identified the need to reduce pollutant loading from the watershed.

Scope: The wetland downstream of County Ditch 13, expanded in 1998 when the $FeCl_3$ system was installed, accumulates sediment behind the weir & silt curtain. Unless and until erosion and soil loss are controlled in the CD-13 drainage area, regular removal of accumulated material will be required. Removal of the material will reduce the likelihood that the wetland is serving as a source of phosphorus, and is necessary for the continued function of the wetland as both pre-treatment for the $FeCl_3$ facility and as wildlife habitat.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	0
2017	0
2018	600
2019	0
Total	*600*

Sources	
Tax	X
Grant	X
Other	X

Watersheds	
Upper	X
Spring	
Prior	
Outlet	

4.2.2 Operations and Maintenance

There are a series of ongoing programs that the District funds on a yearly basis in order to advance its goals and meet statutory obligations. In addition, the District owns a number of facilities and easements that it inspects and maintains every year.

4.2.2.1 Cost-Share Incentives

Need: Individual actions by landowners add up to significant impacts on the landscape of the watershed. The District must directly engage with landowners in a targeted fashion to further its goals of phosphorus reduction and water resources education.

Scope: The District will develop and implement a results-focused cost-share program that engages rural, urban, shoreline, and business landowners. The program will seek to include external entities where feasible, including but not limited to Scott SWCD and WREP for agricultural landowners and Blue Thumb for urban and shoreline owners. Where possible, the District will seek to work with or leverage state-wide and federal conservation programs. The District will utilized up-to-date materials, including the Agricultural BMP Handbook, when evaluating proposed cost-share BMPs.

The program will be organized around a pay-for-performance principle, primarily a "dollar(s) per pound of phosphorus removed" or "dollar(s) per viewing of educational material" approach. The Board of Managers will adopt a cost-share framework that lays out in detail what projects are eligible and how compensation may occur.

Funding

	Amounts ($1,000)
2010	30
2011	30
2012	30
2013	65
2014	150
2015	150
2016	150
2017	150
2018	150
2019	150
Total	*1,055*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	

4.2.2.2 Property Tax Incentive Program

Need: Increased incentives for private landowner participation/acceptance of stormwater management BMPs.

Scope: Coordinate with Scott County, state and other government agencies to explore feasibility of a property tax incentive program for stormwater management BMPs. This would be a possible source of compensation for participants in the District's cost-share incentive program (4.2.2.1). The District has begun working with a group of local farmers to help guide outreach and implementation in the rural areas of the watershed. This farmer-led council is anticipated to provide significant input on how a property tax incentive program would be structured.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	30
2014	10
2015	0
2016	0
2017	0
2018	0
2019	0
Total	*40*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	

4.2.2.3 Highway 13 Wetland, Ferric Chloride System & Desiltation Pond Operation and Maintenance

Need: Proper operation and periodic maintenance is required to assure that the County Ditch 13 ferric chloride system continues to perform at design efficiency. In addition, periodic maintenance excavation of the desiltation basin is required and design improvements are warranted for both basins.

Scope: The ferric chloride system installed on the County Ditch 13 channel immediately south of Highway 13 was constructed in 1998. Current operating expenses are estimated at $10,000 per year for chemicals, electricity, maintenance, and follow-up monitoring. The structure and ferric chloride feed system will require periodic adjustment and inspection to ensure effective operation.

A desiltation (i.e. sedimentation) pond is located on the County Ditch 13 tributary entering the southwest corner of Spring Lake. The pond was one of the earliest District projects and was designed to decrease sedimentation occurring in the western end of Spring Lake. The basin has been maintained on several occasions over the years, most recently in the winter of 2011-2012, and is located immediately downstream of the ferric chloride injection station. Maintenance of the desiltation basin is anticipated to cost approximately $150,000 every ten years.

Funding

	Amounts ($1,000)
2010	25
2011	75
2012	25
2013	25
2014	25
2015	25
2016	25
2017	25
2018	25
2019	25
Total	*300*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper Spring	X
Prior Outlet	

4.2.2.4 Conservation Drainage Pilot Project

Need: Minimize runoff volume and nutrient loading from agricultural lands to help mitigate the impairment of Spring Lake and Upper Prior Lake.

Scope: The District will inventory drain tile within the District, building on the knowledge and databases of the Scott SWCD and with input and guidance from local farmers, and in cooperation with Spring Lake Township. Based on this inventory the District will solicit landowner participation in a pilot project to construct a conservation drainage control structure to limit runoff and nutrients otherwise not controlled by the drain tile system. Monitoring is expected to be conducted for a period of three years. Part of this project will include evaluating how the NRCS Drainage Water Management program could coincide with the District's goals, and what lessons learned from that program could be adopted locally.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	5
2014	15
2015	10
2016	5
2017	5
2018	0
2019	0
Total	*40*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	
Prior	
Outlet	

4.2.2.5 Aquatic Vegetation Management

Need: Aquatic invasive vegetation can impact water quality and must be managed to assure that its growth is limited and water quality impacts minimized.

Scope: In 2013 the District partnered with the City of Prior Lake to treat invasive aquatic vegetation impacting water quality of Prior Lake. The District will pursue continuing that arrangement in the future, on years when treatment of aquatic vegetation is required. The District will not treat or harvest aquatic vegetation where the impact is solely to recreation or navigation. The District has contracted with Blue Water Science to provide aquatic vegetation management plans for the District in the past, and will continue to contract with this or other consultants to obtain these data in the future.

Funding

Amounts ($1,000)	
2010	5
2011	5
2012	5
2013	5
2014	5
2015	5
2016	5
2017	5
2018	5
2019	5
Total	*50*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	

4.2.2.6 Fish Management

Need: An important component of internal load and biotic integrity management in lakes is the maintenance of a beneficial fish community.

Scope: The District will work in partnership with the DNR, University of Minnesota, and other partners to manage the rough fish population and maintain a beneficial fish community on Prior Lake. The District will continue to partner with Dr. Peter Sorenson to conduct rough fish research for the District.

The District will work to establish carp population densities. These density estimates will guide further actions. If densities are determined to be high enough to trigger a significant water quality and/or ecological concern, the District may choose to focus greater effort on carp removal, including seining and restricting carp movement with fish gates. If the density is low enough that it is neither a pressing ecological nor water quality concern, the District may choose to de-emphasize carp reduction in favor of population management, utilizing fewer resources to do so.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	15
2013	20
2014	20
2015	20
2016	20
2017	20
2018	20
2019	20
Total	*155*

Sources	
Tax	X
Grant	
Other	

Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	

4.2.2.7 CD 13 In-Line Treatment Operation and Maintenance

Need: The Spring Lake-Upper Prior Lake Nutrient TMDL identified a 3,800 lb. of phosphorus per year watershed load to Spring Lake. Controlling watershed load is necessary to improve water quality and clarity in Spring Lake.

Scope: After construction of an in-line or parallel treatment in CD 13 (if recommended by the feasibility study), the system will have to be maintained. This will vary depending upon the type of system installed. It may include replacement of filters, excavation of accumulated material, and/or other unforeseen activities.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	0
2017	0
2018	7
2019	7
Total	*14*

Sources	
Tax	X
Grant	
Other	

Watersheds	
Upper	X
Spring	
Prior	
Outlet	

4.2.2.8 Biological Nutrient Removal Operation and Maintenance

Need: The Spring Lake-Upper Prior Lake Nutrient TMDL identified a 3,800 lb. of phosphorus per year watershed load to Spring Lake. Controlling watershed load is necessary to improve water quality and clarity in Spring Lake.

Scope: After construction of a biological nutrient removal system, the system will have to be maintained. This will vary depending upon the type of system installed. If the system is a replacement or enhancement of an existing chemical treatment system, these costs may be included in the cost of maintaining the existing system.

This project is *unfunded*. The District does not plan to actively pursue, levy for, or allocate funding toward this project unless a significant source of funding becomes available, there is a significant increase in interest in the project from local stakeholders, or the District understanding of how this technology could be utilized improves.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	~~15~~
2017	~~15~~
2018	~~15~~
2019	~~15~~
Total	~~60~~

Sources	
Tax	X
Grant	
Other	

Watersheds	
Upper	X
Spring	X
Prior	
Outlet	

4.2.2.9 Buck Lake Channel Chemical Treatment System Operation and Maintenance

Need: The Spring Lake-Upper Prior Lake Nutrient TMDL identified a 3,800 lb. of phosphorus per year watershed load to Spring Lake. Controlling watershed load is necessary to improve water quality and clarity in Spring Lake.

Scope: After construction of the Buck Lake channel chemical treatment system (if recommended by the feasibility study), the system will have to be maintained. This will likely include the same actions as the CD 13 $FeCl_3$ system, including purchase of chemical material, regular inspections, and excavation of accumulated material.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	25
2017	25
2018	25
2019	25
Total	*100*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	
Prior	
Outlet	

4.2.2.10 Ducks Unlimited Weir/BMP Operation and Maintenance

Need: Both the District's Volume Management Study and the Spring Lake-Upper Prior Lake nutrient TMDL identify the need to reduce runoff to Spring and Prior Lakes. The restricted outlet on Prior Lake requires that new runoff volumes be limited, while the TMDL identified the need to reduce pollutant loading from the watershed.

Scope: The last stop before reaching Spring Lake for water coming through the Buck Lake channel system is the Ducks Unlimited wetland, located just north of the intersection of Highway 13 and 180th Street. After construction of the Ducks Unlimited weir or BMP, the system will have to be maintained. Maintenance activities will include regular inspections and ensuring that the device is clear of debris. If the device is actively managed, such as with a slide gate or removable stop logs, it will also have to be operated appropriately.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	0
2017	2
2018	2
2019	2
Total	*6*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper Spring	X
Prior Outlet	

4.2.3 Planning

Planning is integral to the efficient and effective management of the District's resources, and to ensure regular progress toward District goals. Planning includes staying abreast of regional, state, and federal water resource issues, keeping the District's Water Resources Management plan up to date, reviewing plans from other local government entities, and performing studies and feasibility reports.

4.2.3.1 Planning and Programming Development

Need: District staff should understand current and upcoming planning and programming issues and be aware of general trends and state-of-the-practice in watershed management.

Scope: District staff will continue to keep abreast of general watershed planning issues, including issues of local, regional, state, and national significance. Staff will assist the Board of managers with periodic self-assessments, identify potential program revisions and maintain current operations. This will include funding for staff training, education, and attendance at conferences as appropriate.

Funding

Amounts ($1,000)	
2010	20
2011	20
2012	20
2013	35
2014	35
2015	35
2016	35
2017	35
2018	35
2019	35
Total	*305*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	

4.2.3.2 Spring/Upper Prior Lake TMDL Implementation Plan

Need: The Spring Lake-Upper Prior Lake TMDL and Implementation Plan identifies a number of activities to improve water quality in the lake, some of which will be undertaken by local governments and some by the District.

Scope: The TMDL Implementation Plan was completed in 2012. The implementation items included in that document are incorporated into other items in Section 4 of this plan. The remaining funding in this capital project area is primarily for tracking implementation activities.

Funding

	Amounts ($1,000)
2010	30
2011	30
2012	100
2013	5
2014	2
2015	2
2016	2
2017	2
2018	2
2019	2
Total	*174*

Sources	
Tax	X
Grant	X
Other	X

Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	

4.2.3.3 Review District Jurisdictional Border

Need: An area outside the District's jurisdictional border discharges to the Outlet Channel. An area inside the border discharges to Cates Lake, which is outside the hydrologic boundary of Prior Lake. There are other discrepancies between the District's hydrologic and jurisdictional boundaries.

Scope: The District will work together with local governments, Scott County, and the Board of Water and Soil Resources to review for potential modification the District jurisdictional boundary. If all parties are willing and the legal foundation for boundary change is met, the District will consider modifying the jurisdictional border to more closely match the hydrologic border, possibly including the Cates Lake and Prior Lake Outlet Channel areas.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	15
2014	15
2015	0
2016	0
2017	0
2018	0
2019	0
Total	*30*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	X

4.2.3.4 LGU Plan Review

Need: Per Minnesota statute, all local government entities are required to have Local Water Management Plans that accord with the Watershed District Water Resources Management Plan.

Scope: In 2013 Scott County and the City of Prior Lake are anticipated to submit updates to their Local Water Management Plans (LWMP) that meet updated requirements adopted as an element of the 2010 PLSLWD Water Resources Management Plan. Updated plans will be reviewed, as well periodic changes to the LWMPs as they are altered to suit the needs of the community.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	5
2014	2
2015	2
2016	2
2017	2
2018	2
2019	2
Total	*17*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	X

4.2.3.5 District Plan Update

Need: Per Minnesota statute, all local government entities are required to have Local Water Management Plans that accord with the Watershed District Water Resources Management Plan.

Scope: The District adopted this Water Resources Management Plan in 2010. One policy of the plan is to review the plan annually, incorporating new knowledge, regulatory changes, and other updates as needed. The 2013 update is anticipated to be a significant revision. Other updates are anticipated to be smaller, often to meet statutory requirements that capital projects be appropriately included in the Capital Improvement Plan. In 2019 the District will begin work on a complete revision to the plan.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	20
2014	2
2015	2
2016	2
2017	2
2018	2
2019	25
Total	*55*

	Sources
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	X

4.2.3.6 Feasibility Reports

Funding	
	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	30
2014	50
2015	50
2016	40
2017	30
2018	0
2019	0
Total	*180*
Sources	
Tax	X
Grant	
Other	
Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	X

Need: The District has an extensive Capital Improvement Plan to attain its goals. Feasibility reports are necessary for each project proposed to determine the likely outcome of the project and the appropriateness of proceeding.

Scope: For each project proposed in the Capital Project subsection of the Implementation section of this plan, and as appropriate to the scale, technical uncertainty and range of options, the District will have a feasibility report drafted to determine the viability of the project. This will typically include a cost benefit analysis of the project, an examination of potential complications as well as secondary benefits, an approximately very rough design of the project, and a proceed/do not proceed recommendation. Projects that have been recommended due to another study or report, such as the Lower Prior Diagnostic Study, may not require a separate feasibility. Feasibility report costs are anticipated to be between 10 and 20% of the total project cost, depending on the complexity of the project. Feasibility reports will be scheduled for the year prior to project design and implementation. The following are among the feasibility reports are anticipated:

- 2013 – Buck Lake Channel Chemical Treatment.
- 2014 - Buck Lake Channel and Lake Restoration, Spring Lake Outlet Channel Restoration
- 2015 – Ducks Unlimited Weir, Upper Watershed Outlet Modification[1]
- 2016 – Fish Lake Internal Load Management, CD-13 In-line or Parallel Treatment
- 2017 – CD 13 Wetland Dredge

[1] The Upper Watershed Outlet Modification feasibility study would include investigation of the possible alteration of outlets of some or all of the lakes in the upper watershed (Buck, Fish, Swamp, and Sutton). Close consultation with (at least) the DNR and Spring Lake Township will be required. It is not included in the Capital Projects section of this Implementation Plan, so no funds are allocated for design, construction, or maintenance; if the Board chose to move forward with the project after feasibility, a plan amendment would be required.

4.2.3.7 Complete Pike Lake TMDL

Need: Pike Lake has been listed as an Impaired Water for excess nutrients. A TMDL study has not yet been initiated.

Scope: The MPCA has guided this TMDL study for 2018, at which point their intensive watershed monitoring will be complete. The District anticipates taking the lead on the completion of this TMDL, working with the City of Prior Lake, the Shakopee Mdewakanton Sioux Community and other stakeholders to complete the TMDL study and implementation plan for Pike Lake in the future. The District may choose to refrain from initiating additional TMDL studies until the MPCA has developed firm guidance and requirements for TMDLs.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	0
2017	0
2018	25
2019	0
Total	*25*

Sources	
Tax	
Grant	
Other	X

Watersheds

Upper Spring	
Prior	
Outlet	X

4.2.3.8 Complete Fish Lake TMDL

Need: Fish Lake has been listed as an Impaired Water for excess nutrients. A TMDL study has not yet been initiated.

Scope: The MPCA has guided this TMDL study for 2018, at which point their intensive watershed monitoring will be complete. The District anticipates working with Spring Lake Township and other stakeholders to complete a TMDL study and implementation plan for Fish Lake in the future. The District may choose to refrain from initiating additional TMDL studies until the MPCA has developed firm guidance and requirements for TMDLs. Until that time the District may, as an alternate course of action, implement the Fish Lake Management Plan.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	0
2017	0
2018	25
2019	0
Total	*25*

Sources	
Tax	
Grant	
Other	X

Watersheds

Upper	X
Spring	
Prior	
Outlet	

4.2.3.9 Update 1993 Diagnostic/Feasibility Study for Spring and Prior Lakes

Need: The most complete report on the condition of Spring and Prior Lakes is the 1993 Diagnostic/Feasibility Study, which is currently 20 years old.

Scope: Spring and Prior Lakes are complex systems, with interrelated factors affected water quality including biological communities, geological features, and hydrologic and hydraulic systems. The 1993 Diagnostic/Feasibility Study brought all of these factors together in a single report, and used the collected data to make recommendations for projects to improve the management of the District's major lakes.

By 2018 the data in the Study will be 25 years old, and based on outdated information. In addition, some major alterations have been, and will be, implemented, including chemical treatment systems, in-lake phosphorus load management, alteration of the hydrology and hydraulics of the watershed, to name a few. Furthermore, in 2019 the District will begin revisions to this plan, which will shape activities for the next ten-year span (from 2020 to 2030). A revised Diagnostic/Feasibility Study will provide the technical background for a sound Water Resources Management Plan.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	0
2016	0
2017	0
2018	100
2019	0
Total	*100*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper Spring	X
Prior	X
Outlet	

4.2.3.10 Comprehensive Wetland Plan

Need: Minnesota Statutes require watershed management plans to include an inventory of the functions and values of wetlands within its borders, or to set forth a plan to collect this information.

Scope: In 2012 the District Board approved a Wetland Management Plan. This plan was created with input from the local governments, the TEP, and the US Army Corps of Engineers, and identified wetland functions and values. The District conducted the wetland inventory by compiling all previous wetland inventory and assessment projects, then conducting field inventories and collecting data on wetland functions using the Minnesota Routine Assessment Method version 3, with staff from the District, EOR, and the Scott SWCD. Citizens and stakeholders were engaged in the process through a wetland values survey.

As of winter 2012 the Wetland Management Plan has been written and approved by the Board. This project has been substantially completed, and is included in this plan for historical purposes. An update to the plan may be required in 2022, as wetlands are created, destroyed, or otherwise altered.

Funding

	Amounts ($1,000)
2010	35
2011	65
2012	6
2013	0
2014	0
2015	0
2016	0
2017	0
2018	0
2019	0
Total	*106*

Sources	
Tax	X
Grant	
Other	

Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	X

4.2.4 Monitoring and Research

Attaining the District's goals requires regularly expanding the understanding of the District's ever-changing natural resources. The monitoring program gathers data, primarily hydrologic, hydraulic, and water quality data, that inform the District's actions and understanding of trends. Research funded or performed by the District improves the understanding of how water systems work, informing models and other tools and making implementation activities more effective.

4.2.4.1 District Monitoring Program

Need: Minnesota Rules 8410.0100 requires Management Plans to include data collection programs "…capable of producing accurate data to the extent necessary to determine whether the water quality and quantity goals of the organization are being achieved."

Scope: The District currently operates a monitoring program that will be continued and potentially expanded during this planning period. Water quality and quantity monitoring efforts will be completed in accordance with a District Monitoring Plan that includes coordination of the volunteer CAMP program, lake level readings, precipitation monitors, implementation of stream monitoring, GIS data acquisition, equipment purchase and maintenance, data management and reporting. Section 3.2.1.1 of this Plan describes the current monitoring program, which is included in Appendix K, however, the Monitoring Plan will be periodically updated based on changing needs, TMDLs and implementation plans. The District will seek to maximize monitoring funds through the use of volunteer citizen monitors, as well as cooperative agreements with Scott SWCD, local governments and other agencies to reduce monitoring costs and duplication of efforts. Data collected by the District will be reported to the regional reporting database STORET or its successor.

Funding

	Amounts ($1,000)
2010	70
2011	70
2012	90
2013	90
2014	90
2015	90
2016	90
2017	90
2018	90
2019	90
Total	*860*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	X

4.2.4.2 Fish Surveys

Need: An important component of internal load and biotic integrity management in lakes is the maintenance of a beneficial fish community. As part of its comprehensive lake management plan, the District periodically obtains fish surveys on Spring, Prior, and Fish lakes.

Scope: The District will contract to obtain periodic fish surveys for the District to monitor changes in the fish and aquatic life community and to inform the fishery management program, including rough fish management.

Funding

	Amounts ($1,000)
2010	0
2011	15
2012	15
2013	10
2014	10
2015	10
2016	10
2017	10
2018	10
2019	10
Total	*100*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	

4.2.4.3 Research

Need: Not all issues identified with the District's Water Resources Management Plan are fully understood or have feasible options identified to address the problem.

Scope: The District will conduct or contribute to research targeting problems identified in the District's Water Resources Management Plan and participate in researching topics regarding state-of-the-practice watershed management.

Funding

Amounts ($1,000)	
2010	0
2011	10
2012	10
2013	10
2014	10
2015	10
2016	10
2017	10
2018	10
2019	10
Total	*90*

Sources	
Tax	X
Grant	
Other	

Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	X

4.2.4.4 Aquatic Vegetation Surveys

Need: As part of its comprehensive lake management plan, the District periodically obtains aquatic vegetation surveys on lakes to monitor changes in the aquatic vegetation community and to inform the aquatic vegetation management program.

Scope: The District has contracted with Blue Water Science to provide aquatic vegetation surveys for the District in the past, and will continue to contract with this or other consultants to obtain this data in the future.

Funding

	Amounts ($1,000)
2010	10
2011	10
2012	10
2013	10
2014	10
2015	10
2016	10
2017	10
2018	10
2019	10
Total	*100*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	

4.2.4.5 High Flow Tracking and Doppler Sounding

Need: Accurate water velocities and sedimentation depths are vital data for maintaining important District infrastructure.

Scope: The District has a number of key high-velocity flow locations (such as the daylight of the outlet pipe and the County Ditch 13 wetland wier) that are difficult to track with a standard velocity meter. In addition, some areas accumulate sediment by design (again, the County Ditch 13 wetland, as well as the desiltation basin), and are difficult or expensive to survey. Purchase of a floating flow tracker, based on Doppler sounding, will allow District staff to both monitor high-velocity flows and take very accurate cross sections of channels and ponds.

The City of Prior Lake has expressed an interest in a technology for tracking sediment accumulation rates in ponds. Pooling funds to purchase of this device may be a way for the District and the City to minimize equipment costs by purchasing a single piece of equipment to meet the needs of both organizations; the District will pursue sharing cost with the City.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	20
2015	0
2016	0
2017	0
2018	0
2019	0
Total	*20*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	X

4.2.4.6 Infiltration Enhancement Pilot Project

Need: The Volume Management Plan and the Spring Lake-Upper Prior Lake nutrient TMDL identify the need to reduce runoff to the lakes, to reduce pollutant loading and to help manage the restricted outlet from Prior Lake.

Scope: Development and redevelopment projects typically use heavy equipment to perform grading and other construction activity. This equipment can cause site soils to become compacted and less able to infiltrate runoff. Permeability can be restored or increased through soil enhancement techniques such as soil ripping and soil amendment. Alternative construction techniques can also be used to minimize soil compaction. This project consists of a feasibility study in year one and a demonstration project in year two to investigate and implement soil enhancement techniques for effectiveness in reducing runoff. The feasibility study will include of review of existing studies and work completed by agencies such as University of Minnesota Extension Service, the Scott SWCD, and Three Rivers Park District on types of enhancements; coordination with local cities and utility companies to evaluate regulatory and development requirements and to explore ideas such as single conduit utilities hookups to houses; and identification of potential demonstration site locations – at least one commercial and at least one residential - and development of a monitoring plan to evaluate effectiveness. District cost share is limited to the incremental difference between the project cost and the cost of minimum compliance with regulatory requirements, unless individual projects are approved otherwise.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	10
2014	20
2015	0
2016	0
2017	0
2018	0
2019	0
Total	*30*

Sources	
Tax	X
Grant	
Other	

Watersheds	
Upper	X
Spring	X
Prior	
Outlet	

4.2.4.7 District-wide Hydrologic and Hydraulic Model

Need: Accurate flow rate and volume is required for implementation of projects that are cost-effective and perform as designed. A pollutant loading model will also help to identify new areas to target for projects.

Scope: There are currently two XP-SWMM models that include flow estimates for parts of the District. One, recently revised by the District Engineer, encompasses the Outlet Channel drainage area and is aimed at improving decision-making by the JPA/MOA group; that model is outside the scope of this project. The other covers the rest of the District. It was created in the early 2000s, and it was primarily designed for anticipating flood elevations on Prior Lake due to various storm events. It is insufficiently detailed to forecast water elevations, flows, or pollutant loading in other locations around the District.

In 2013 District staff, along with the District engineer, will review the existing XP-SWMM model, determine the needed improvements, and whether it is more appropriate to us a different modeling program, start from scratch with a new XP-SWMM model, or update the existing model. In 2014 the District engineer will develop a scope of work, to be approved by the Board, to create or update a District-wide model. In subsequent years the District engineer and/or District staff will maintain the model, by keeping it functioning with new versions of the modeling software, making changes in the model as they are implemented on the ground, and revising it as new data become available and mistakes are discovered.

Funding

Amounts ($1,000)	
2010	0
2011	0
2012	0
2013	5
2014	75
2015	25
2016	2
2017	2
2018	2
2019	2
Total	*113*

Sources	
Tax	X
Grant	
Other	

Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	

This District-wide model will allow the Managers to make better choices, by refining their understanding of the impact of various projects, policies or rules, and by pinpointing areas of concern.

4.2.4.8 MIDS Participation

Need: The District and its resources are directly affected by state-level actions, and should participate in shaping them where possible.

Scope: The Minimal Impact Design Standards (MIDS) group is working to develop recommendations for site and development design that minimize their impact on the environment, and in particular stormwater. This group has participants from state agencies including the DNR and MPCA, private consultants, and various local government units. The recommendations are likely to be used as a basis for guidance and possibly regulation for years to come. PLSLWD staff will attend these meetings, in an effort to both provide input in keeping with the District's goals and policies and to learn current thinking from professionals around the state. It is anticipated that the effort will be completed around 2015.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	5
2014	5
2015	5
2016	0
2017	0
2018	0
2019	0
Total	*15*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	X

4.2.4.9 Zebra Mussel Tracking

Need: Zebra mussels are a concern for lake water quality and ecology.

Scope: Upper and Lower Prior lakes are infested with zebra mussels. Other waters in the District are likely either already infested, or at significant risk of infestation. Zebra mussels are an invasive species that can have significant ecological and water quality effects, particularly in killing off native mussels and creating nuisance conditions on shoreline structures and water intakes. A less direct, but equally problematic, concern with zebra mussels is that commercial fishermen are not allowed to reuse equipment in "clean" waters that have been used in infested waters, leading many fishermen to avoid infested waters altogether; if Spring Lake were to host a zebra mussel population, it would be difficult to continue to harvest carp for rough fish management.

Monitoring for zebra mussels is fairly simple, involving simply dropping a block of a suitable material (such as concrete) into the water, then pulling it up after a few weeks or months and inspecting for mussel growth. This work will be coordinated with volunteers, possibly with the volunteers already involved in CAMP monitoring. District involvement will be limited to verifying and recording the collected data.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	2
2014	2
2015	2
2016	2
2017	2
2018	2
2019	2
Total	*14*

Sources	
Tax	X
Grant	
Other	

Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	X

4.2.4.10 Automated Vegetation Monitoring

Need: Aquatic vegetation can be a nuisance when present in too great quantities, yet moderate quantities are necessary for in-lake nutrient management. Curlyleaf pondweed can also contribute to in-lake phosphorus cycling.

Scope: New acoustic sounding technology and data analysis software has made surveying an entire lake for vegetation percent abundance much more reasonable. Unlike rake samples, these data can pinpoint specific clumps of growth, cover an entire lake, and generally give much more detailed information. A company called Contour Innovations/CiBioBase offers a program for recording and analyzing these data. The District will contract with CiBioBase, and coordinate with lake associations on Prior and Spring lakes to oversee the collection and uploading of tracks and acquire the necessary equipment. The data collected will complement the Aquatic Vegetation Surveys. After the first year the District will evaluate the success of the program and decide whether to continue or discontinue the work.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	8
2014	8
2015	8
2016	8
2017	8
2018	8
2019	8
Total	*56*

Sources	
Tax	X
Grant	
Other	X

Watersheds	
Upper	
Spring	X
Prior	X
Outlet	

4.2.5 Regulation

In addition to the authority to construct capital projects and implement programs, the District has the authority to create rules that relate to water resources. The District has programs in place to administer these rules, coordinate with other regulatory entities, and manage easements that have been acquired in the course of applying the rules.

4.2.5.1 Permitting and Compliance

Need: To assure that development, redevelopment, and land disturbing activities meet District requirements.

Scope: District staff will continue to participate in city Development Review Committees and Scott County Development Review Team meetings to incorporate water quality and quantity BMPs on new development and redevelopment.

The District will continue to pursue MOA and equivalency determination with the City of Shakopee and will continue to monitor permitting activities of existing MOA partners. The District will continue to monitor construction sites for erosion and sediment control practices, and coordinate reporting of those inspections with local entities.

The District will continue to issue permits for municipal projects. The District will also issue permits for projects within District easements, specifically easements on the Prior Lake Outlet Channel, and when requested by the local municipality or called for by District rules, agreements with other entities, or watershed law.

The District will continue to allow local units of government to decide whether they would prefer to serve as the LGU under the Wetland Conservation Act; the District will serve as the LGU when requested by local units of government. Presently other local and state authorities have LGU status under WCA for the entire watershed, including MnDOT on its right-of-way.

District staff will continue work to close out permits on abandoned or completed projects, wrapping up accounting loose ends.

Funding

	Amounts ($1,000)
2010	50
2011	40
2012	25
2013	18
2014	18
2015	18
2016	18
2017	18
2018	18
2019	18
Total	*241*

Sources	
Tax	X
Grant	
Other	X

Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	X

4.2.5.2 Rules and Standards Revisions

Need: To bring the District's Rules and Standards in agreement with the findings of the TMDLs and other studies.

Scope: Various studies completed by the Board of Managers, this Management Plan and the Spring Lake-Prior Lake Nutrient TMDL all identify potential revisions to the District's rules and standards to improve water quality and manage stormwater volume. As of Spring 2013, the District is in the midst of a rules and standards revision process that is evaluating regulations with input from a Technical Advisory Committee. The District intends to adopt rules in late 2013 that are consistent with the continued use of Memorand of Agreement establishing equivalency of local ordinances and District rules. As new regulations at a local and state level are established, and as science regarding stormwater management improves, the District anticipates the need to periodically make minor updates to the Rules.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	40
2013	10
2014	0
2015	0
2016	10
2017	0
2018	0
2019	0
Total	*60*

	Sources
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	X

4.2.5.3 Wetland Restoration and Wetland Bank

Need: It is a District goal to restore or enhance wetlands or partial wetlands to recover lost values in critical areas.

Scope: The District has restored several wetland areas in the watershed and has created an inventory of potential additional sites. The District will routinely inspect and perform maintenance on previously completed sites as needed.

The District will continue to solicit wetland restoration program participation by expanding communication and education programs regarding wetland restoration and acquisition. Where they qualify, the District will attempt to enroll wetlands into the BWSR wetland bank.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	50
2013	50
2014	50
2015	50
2016	20
2017	20
2018	20
2019	20
Total	*250*

Sources	
Tax	X
Grant	X
Other	X

Watersheds	
Upper	X
Spring	
Prior	
Outlet	

4.2.5.4 BMP and Easement Inventory

Need: Over the years the District has taken on maintenance responsibility for various BMPs as well as obtained conservation easements and easements for the Prior Lake Outlet Channel and other BMPs. Information regarding the location, extent, rights, and responsibilities is scattered in multiple locations, and there is no central repository for that data, limiting its usefulness and increasing the risk that important information will not be available when needed.

Scope: This activity is a project to create an electronic inventory of all BMPs installed through District permits as well as District-held conservation and project easements. Additional work may include coordinating with the Scott SWCD on a tillage residue survey, or partnering with other entities on updating the culvert inventory. This work will allow for increased efficiency in both monitoring and enforcement, and increase landowner awareness of existing easements. The inventory of BMPs will also provide information needed to complete targeted efforts to establish BMPs in both critical areas as well as those with few or no existing features. After the inventory is created the District will periodically inspect easements for adequacy and potential encroachment, and will obtain new or revised easements where necessary. Partnerships with the local governments, Scott County, and the Scott SWCD will be explored to facilitate information and resource sharing.

Funding

	Amounts ($1,000)
2010	15
2011	15
2012	15
2013	15
2014	15
2015	15
2016	15
2017	15
2018	15
2019	15
Total	*150*

Sources	
Tax	X
Grant	
Other	

Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	X

4.2.5.5 Pollutant Trading Pilot

Need: The nutrient TMDL study for Spring and Upper Prior lakes established aggressive landscape load reduction goals.

Scope: Pollutant trading is a method wherein generators of pollution are allotted a certain amount, or credit, of pollution (in this case, either lbs. of phosphorus per year or acre-feet of water volume discharge per year), and then allowed to trade amongst each other for the credits. Those with greater capacity to reduce their own pollutant loading can make a profit by selling their credits; those with less capacity to reduce pollutant loading can purchase credits. Given sufficient participants in the market, this approach can increase efficiency and decrease both overall pollutant discharge and economic activity.

The District will work with an economist to explore the potential of creating a phosphorus or water volume market in watersheds to key resources of the District. The District will also work with the Scott WMO to leverage their insights regarding other pollutant trading efforts they have undertaken.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	0
2014	0
2015	20
2016	0
2017	0
2018	0
2019	0
Total	*20*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	

4.2.6 Education and Outreach

The best advocate for water resources is an engaged and informed citizenry. Educational programs are designed to improve the general understanding of water resources and the impact each citizen has upon them. Outreach programs seek to make connections and change behaviors.

4.2.6.1 MS4 Education Program

Funding	
	Amounts ($1,000)
2010	50
2011	50
2012	53
2013	50
2014	50
2015	50
2016	50
2017	50
2018	50
2019	50
Total	*503*
Sources	
Tax	X
Grant	
Other	
Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	X

Need: The District and other local government units with Municipal Separate Storm Sewer System permits from the MPCA are required to provide certain educational opportunities for their citizens. In addition, the District has identified increasing knowledge and understanding of water as a goal of the organization.

Scope: The District's information and education program anticipates a variety of activities to reach out to various stakeholders throughout the watershed. Some current and potential activities include:

- Attendance at community events.
- Publication of annual reports and brochures.
- Periodic submittal of news articles to the *Prior Lake American* newspaper and other newsletters.
- Utilization of various media types. This includes maintenance of the District website and could also include using commercials on cable access television.
- Occasional informational classes.
- Soliciting input from the general public and TAC and CAC members.
- Partnering with other jurisdictions to provide one-on-one assistance with lakeshore property owners on runoff management, lakeshore restoration, etc.
- Partnering with Project NEMO to provide enhanced education and outreach activities for elected and appointed officials, advisory commission members, and city and township staff.
- Utilizing existing community events and incorporation a "carp fishing contest" whereby prizes would be awarded for most poundage of carp removed from the lake.

The District works with partners, including the cities of Prior Lake and Savage, to implement programs that meet and may exceed the education requirements of the MS4 permit. Programs include workshops about lawn care and raingarden installation, and the Raingarden-in-a-Box program developed in conjunction with the City of Prior Lake in 2013. The Education program's progress and activities will be reviewed quarterly by staff and annually by the Board. Finally, the District will continue to update technology within its office to ensure more efficient access to documents and information as it is requested from the public.

4.2.6.2 Prior Lake-Savage Area Schools (ISD 719) Partnerships

Need: The Board wishes to enhance partnerships with the school district to provide education and outreach activities to students, families, and educators, and to advise and partner with the school administration on ways to enhance management of school district owned facilities and grounds.

Scope: The District maintains an ongoing relationship with school district administrators and teachers on various education and site management issues. That partnership will continue and may be expanded to incorporate additional education and outreach activities for students, families, educators, and school district staff. The school district will be completing site assessments and creating a management plan for all school district properties. This assessment and management plan will be used to identify priority areas and to coordinate project implementation. The District may consider cost sharing with the school district on some of the improvements listed in their management plan with priority in TMDL-targeted areas. Specifically, there may be opportunities to create long-term demonstration and study sites for various BMPs such as alternative methods for turf management using alternative grass types, and BMPs to reduce runoff/chemical inputs to large turf grass play areas. These funds may also be used as a match to grants from other sources.

Funding

	Amounts ($1,000)
2010	10
2011	10
2012	10
2013	5
2014	5
2015	5
2016	5
2017	5
2018	5
2019	5
Total	*65*

Sources	
Tax	X
Grant	
Other	

Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	X

Potential project areas identified for implementation by the school district in 2013-2019 are:

- Rain gardens, at Hidden Oaks Middle School and Twin Oaks Middle School as well as other potential locations;
- Stormwater retrofits, at various locations;
- Prairie development, at Jeffers Pond Elementary and Hidden Oaks Middle School;
- Prairie maintenance, at Five Hawks Elementary, WestWood Elementary and Jeffers Pond Elementary;
- Turf management BMPs, at all 10 school sites; and
- Tree planting - WestWood and Edgewood Elementary Schools

4.2.6.3 Information and Education Program – Citizen Advisory Committee

Need: Watershed Districts in Minnesota are required by statute to maintain a Citizen Advisory Committee (CAC) to provide input to the Board on various actions of the district.

Scope: In 2011 the District committed to expanding the capacity of the CAC by having the body hold monthly meetings and adopt bylaws and formal procedures, and by hiring Minnesota Waters to guide the CAC through its formative year. The CAC continues to provide a valuable role, informing the District of water resources concerns in the area and providing feedback on proposed District projects, such as redesigning the $FeCl_3$ system downstream of County Ditch 13 and the proposed Alum application to Spring Lake. District staff will continue to support the CAC, ensuring that monthly meetings continue and providing opportunities for CAC members to become more involved in District activities.

Funding

Amounts ($1,000)	
2010	0
2011	0
2012	9
2013	9
2014	9
2015	9
2016	10
2017	10
2018	10
2019	10
Total	*76*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper	X
Spring	X
Prior	X
Outlet	X

4.2.6.4 Habitat for Watershed / Raingarden Taskforce

Need: Meeting District goals in the long term will require expanding the capacity of ordinary citizens to meet water quality and quantity challenges themselves.

Scope: Presently, if a resident of the District wishes to become involved in water quality or quantity concerns, they can join the CAC, install a project on their property through our cost-share program, or go it alone. While the District continues to refine and improve the cost-share program, the options for engaging with the District involve significant time and effort. This program would target the gap between involvement in the cost-share program and "going it alone".

In the first year the District will work with the CAC and other interested citizens to set up a "Habitat for Watershed" group of volunteers with some basic training in the creation and installation of raingardens and other lake-friendly practices. This group will be available on weekends and evenings for landowners interested in installing such practices. The District will advertise the services of this group to landowners who wish to do something for water resources, but would prefer for whatever reason not to be involved in the District's cost-share program. The District will provide the group with organizational support and training, but would not be financially involved in the installation of practices. District staff will develop a protocol for the program in the first year of operation, and look for potential partnership opportunities with other watershed districts.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	20
2014	10
2015	10
2016	10
2017	10
2018	10
2019	10
Total	*80*

Sources	
Tax	X
Grant	
Other	

Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	X

4.2.6.5 Metro Watershed Partners

Need: The District and other local government units with Municipal Separate Storm Sewer System permits from the MPCA are required to provide certain educational opportunities for their citizens. In addition, the District has identified increasing knowledge and understanding of water as a goal of the organization.

Scope: Metro Watershed Partners (www.cleanwatermn.org) is a coalition of Twin Cities Metro Area governmental units that "places stormwater pollution prevention public education messages in the mass media and maintains the www.cleanwatermn.org website with resources for stormwater educators and seasonal clean water tips for residents." The District already benefits from the work performed by the organization, and could benefit more by becoming actively involved. The District will contribute $5,000 to the program per year, and District staff will provide input and attend meetings as solicited.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	0
2013	5
2014	5
2015	5
2016	5
2017	5
2018	5
2019	5
Total	*35*

Sources	
Tax	X
Grant	
Other	

Watersheds	
Upper	X
Spring	X
Prior	X
Outlet	X

4.2.7 Outlet System

The Prior Lake Outlet Channel is funded by a Joint Powers Agreement/Memorandum of Agreement (JPA/MOA) organization between the District, the Shakopee Mdewakanton Sioux Community, and the Cities of Shakopee and Prior Lake. The District, being the creator of the outlet channel, the owner of the Prior Lake outlet, and the originator of the JPA/MOA group, serves as the administrator of the channel. The District therefore has unique responsibilities for coordinating actions between the members, setting policy, and maintaining the channel.

4.2.7.1 Prior Lake Outlet Structure

Need: The flood level of Prior Lake has a direct effect on the nearly 90 homes located in the floodplain. The proposed new outlet structure will allow the storm sewer portion of the outlet to reach maximum capacity at a much lower lake elevation than the existing structure currently allows. Because of this improved design, the new outlet structure will be less prone to ice damage than the current structure, thus reducing maintenance costs.

Scope: The reconstruction of the Prior Lake Outlet structure project is in progress as this Plan is being developed in 2009. In 2004, the District revised the Outlet Operating Plan to reflect the plans for reconstructing the outlet structure and to minimize the operating restrictions. This revised Operating Plan was approved by the DNR in February 2005 (see Appendix F.) Further revisions to the Operating Plan may be made if necessary to reflect the final design of the new outlet structure. District staff will continue to inspect and maintain the outlet structure as needed post-construction.

Funding

	Amounts ($1,000)
2010	200
2011	25
2012	5
2013	5
2014	5
2015	5
2016	5
2017	5
2018	5
2019	5
Total	*265*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper Spring	
Prior Outlet	X

4.2.7.2 Outlet Channel Restoration and Maintenance

Need: The District has been undertaking restoration of the Prior Lake Outlet Channel on an ongoing basis to stabilize the channel, improve downstream water quality, and improve biotic integrity.

Scope: About 35 percent of the channel length has been completed through 2008. The remaining segments will be completed in the next ten years. Minor erosion issues may occur and will be corrected as part of this activity and in accordance with the Joint Powers Agreement/Memorandum of Agreement regulating operations of the Outlet Channel, which can be found in Appendix F.

Funding

Amounts ($1,000)	
2010	100
2011	25
2012	25
2013	25
2014	25
2015	25
2016	25
2017	25
2018	25
2019	25
Total	*325*

Sources	
Tax	X
Grant	X
Other	X

Watersheds	
Upper Spring	
Prior Outlet	X

4.2.7.3 Outlet Channel Hydrologic Monitoring

Need: There is a need to monitor the flow and water quality in the Outlet Channel to verify flow modeling and to identify any water quality "hot spots."

Scope: In accordance with the District Monitoring Plan described in Section 3.2.1.1 of this Plan, the District will monitor flow and volume in the Outlet Channel to build a hydrologic database for the channel. The District will continue its existing monitoring program on the Outlet Channel to identify water quality hot spots and to verify flow modeling.

In 2014, 2015 and 2016 the District will install telemetry-enabled water depth monitors (pressure transducers). These will give much faster feedback on water conditions in the outlet channel, allowing for better management.

In 2014 the District will install an in-pipe flow monitoring device capable of accurate measurement in high-flow conditions. This will give the District and JPA-MOA members a high degree of certainty regarding the volume of flows leaving Prior Lake.

Funding

	Amounts ($1,000)
2010	8
2011	8
2012	8
2013	8
2014	28
2015	23
2016	23
2017	8
2018	8
2019	8
Total	*125*

Sources	
Tax	X
Grant	X
Other	X

Watersheds

Upper Spring	
Prior	
Outlet	X

4.2.7.4 Outlet Channel Maintenance

Need: The outlet channel is an artificial and potentially unstable conveyance. The District is the entity principally charged with monitoring the channel, and all partners share the costs of resolving issues per the terms of the JPA/MOA.

Scope: The outlet channel has in the past, and will in the future, failed in various ways, including slumping and crumbling banks, meandering outside of the established easement area, and other issues. The JPA/MOA partners, including the District, have committed to maintaining the channel in a functional state. This program will deal with repairs to the channel as needed.

The Lower Minnesota River Watershed District has contracted with Scott County to initiate a study of Deans Lake, which is in line with the outlet channel. The District will continue to communicate with both parties regarding the outcome of that study, as well as the upcoming TMDL study for Deans Lake.

Funding

	Amounts ($1,000)
2010	0
2011	0
2012	10
2013	10
2014	10
2015	10
2016	10
2017	10
2018	10
2019	10
Total	*80*

Sources	
Tax	X
Grant	
Other	

Watersheds

Upper Spring	
Prior	
Outlet	X

Table 4.1. Prior Lake-Spring Lake Watershed District 2010-2019 Implementation Plan.

		Cost per Year (per $1,000)										Goals				
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Efficiency and Effectiveness	Education	Recreation, Aesthetics, Habitat	Phosphorus Reduction (lb/year)	Volume Reduction (acre feet)
Capital Projects																
4.2.1.1	Public infrastructure partnership projects	50	50	50	75	75	75	75	75	75	75	X	X	X	X	X
4.2.1.2	Storage and Infiltration Projects	35	35	35	35	35	35	35	35	35	35			X	60	60
4.2.1.3	Identify and Mitigate Channel Erosion	4	4	4	4	4	4	4	4	4	4	X		X	X	
4.2.1.4	Upper Prior BMP Retrofit			41								X	X	X	X	X
4.2.1.5	Spring Lake Internal Load Management Project			25	500		5	250		5	250				4,200	
4.2.1.6	Upper Prior Lake Internal Load Management Project										450				2,500	
4.2.1.7	CD 13 Ferric Chloride Redesign				255										X	
4.2.1.8	County Roads 12 and 17 Wetland Restoration				80	180						X		X	X	X
4.2.1.9	Buck Lake Channel Chemical Treatment System*				60	140	280								300	
4.2.1.10	Spring Lake Outlet Channel Easement Acquisition				30							X				
4.2.1.11	Spring Lake Outlet Channel Restoration						50	50					X	X	X	
4.2.1.12	Lower Prior Lake Retrofit BMP Study and Projects		39	56	25	25	25	25	25	25	25		X	X		
4.2.1.13	CD 13 In-Line / Parallel Treatment*								150			X			X	
4.2.1.14	Arctic Lake Restoration					100						X		X	X	
4.2.1.15	~~Biological Nutrient Removal*~~						~~300~~					X			X	
4.2.1.16	Implement Fish Lake TMDL Implementation Plan										25		X	X	X	
4.2.1.17	Implement Pike Lake TMDL Implementation Plan										25		X	X	X	
4.2.1.18	Buck Lake Channel and Lake Restoration						60	60	60	60	60			X	X	
4.2.1.19	~~Buck Lake Dredge~~							~~2,100~~							X	
4.2.1.20	Ducks Unlimited Weir/BMP*							150						X	X	X
4.2.1.21	Fish Lake Internal Load Management								300						X	
4.2.1.22	CD 13 Wetland Dredge									600					X	
	Subtotal	89	128	211	1,064	559	534	649	649	804	949				7,060	60
Operations and Maintenance																
4.2.2.1	Cost-share Incentives	30	30	30	65	150	150	150	150	150	150		X	X	X	X
4.2.2.2	Property Tax Incentive Program				30	10						X	X	X		
4.2.2.3	Highway 13 FeCl System Operation and Maintenance	25	75	25	25	25	25	25	25	25	25				X	
4.2.2.4	Conservation Drainage Pilot Project				5	15	10	5	5						X	X
4.2.2.5	Aquatic Vegetation Management	5	5	5	5	5	5	5	5	5	5			X	X	
4.2.2.6	Fish Management, Rough Fish Removal			15	20	20	20	20	20	20	20			X	X	
4.2.2.7	CD 13 In-Line Treatment Operation and Maintenance									7	7				X	
4.2.2.8	~~Biological Nutrient Removal Operation and Maintenance~~							~~15~~	~~15~~	~~15~~	~~15~~				X	
4.2.2.9	Buck Lake Channel Chemical System Operation and Maintenance							25	25	25	25				X	
4.2.2.10	Ducks Unlimited Weir/BMP Operation and Maintenance								2	2	2			X	X	X
	Subtotal	60	110	75	150	225	210	230	232	234	234				-	-

Planning	4.2.3.1	Planning and Program Development	20	20	20	35	35	35	35	35	35	35	X						
	4.2.3.2	Spring/Upper Prior TMDL and Implementation Plan	30	30	100	5	2	2	2	2	2	2		X			X		
	4.2.3.3	Review District Jurisdictional Border				15	15						X						
	4.2.3.4	LGU Plan Review				5	2	2	2	2	2	2	X						
	4.2.3.5	District Plan Update				20	2	2	2	2	2	25	X						
	4.2.3.6	Feasibility Reports				30	50	50	40	30			X						
	4.2.3.7	Complete Pike Lake TMDL and Implementation Plan									25		X	X					
	4.2.3.8	Complete Fish Lake TMDL and Implementation Plan									25		X	X					
	4.2.3.9	Update 1993 Diagnostic/Feasibility Study									100		X	X					
	4.2.3.10	Comprehensive Wetland Plan	35	65	6								X	X	X				
		Subtotal	85	115	126	110	106	91	81	71	191	64					-		-
Monitoring and Research	4.2.4.1	District Monitoring Program	70	70	90	90	90	90	90	90	90	90	X	X					
	4.2.4.2	Fish Surveys & Rough Fish Management Study		15	15	10	10	10	10	10	10	10	X	X	X				
	4.2.4.3	Research		10	10	10	10	10	10	10	10	10	X						
	4.2.4.4	Aquatic Vegetation Surveys	10	10	10	10	10	10	10	10	10	10	X	X	X				
	4.2.4.5	High Flow Tracking/Doppler Sounding					20						X						
	4.2.4.6	Infiltration Enhancement Pilot Project				10	20						X	X			X		X
	4.2.4.7	District-wide Hydrologic and Hydraulic model				5	75	25	2	2	2	2	X						
	4.2.4.8	MIDS Participation				5	5	5					X	X					
	4.2.4.9	Zebra Mussel Tracking				2	2	2	2	2	2	2		X	X				
	4.2.4.10	Automated Vegetation Monitoring				8	8	8	8	8	8	8	X	X	X				
		Subtotal	80	105	125	150	250	160	132	132	132	132					-		-
Regulation	4.2.5.1	Permitting and Compliance	50	40	25	18	18	18	18	18	18	18	X		X		X		200
	4.2.5.2	Rules and Standards Revisions			40	10			10				X						
	4.2.5.3	Wetland Restoration and Wetland Bank			50	50	50	20	20	20	20	20			X		X		X
	4.2.5.4	BMP and Conservation Easement Inventory and Inspections	15	15	15	15	15	15	15	15	15	15	X	X	X				
	4.2.5.5	Pollutant Trading Pilot						20					X				X		X
		Subtotal	65	55	130	93	83	73	63	53	53	53					-		200
Education Outreach	4.2.6.1	MS4 Education Program	50	50	53	50	50	50	50	50	50	50	X	X					
	4.2.6.2	Prior Lake-Savage Area Schools Partnership	10	10	10	5	5	5	5	5	5	5		X			X		X
	4.2.6.3	Information and Education Program - CAC			9	9	9	9	10	10	10	10		X					
	4.2.6.4	Habitat for Watershed / Raingarden Taskforce				20	10	10	10	10	10	10		X			X		X
	4.2.6.5	Metro Watershed Partners				5	5	5	5	5	5	5	X	X					
		Subtotal	60	60	72	89	79	79	80	80	80	80					-		-
Prior Lake Outlet	4.2.7.1	Prior Lake Outlet Structure	200	25	5	5	5	5	5	5	5	5	X						X
	4.2.7.2	Outlet Channel Restoration and Maintenance	100	25	25	25	25	25	25	25	25	25	X		X				
	4.2.7.3	Outlet Channel Hydrologic Monitoring	8	8	8	8	28	23	23	8	8	8	X						
	4.2.7.4	Outlet Channel Maintenance			10	10	10	10	10	10	10	10	X						X
		Subtotal	308	58	48	48	68	63	63	48	48	48					-		-
		Total	747	631	787	1,704	1,370	1,210	1,298	1,265	1,542	1,560					7,060		260

Unfunded Project: descriptions and cost estimates are ~~struck-through~~

June 12, 2013

SECTION 5 - DISTRICT OPERATIONS

5.1 PURPOSE AND REQUIREMENTS

The first water resources management plan for the Prior Lake-Spring Lake Watershed District (District) was prepared and adopted in 1971, shortly after the District's inception, in accordance with the Minnesota Statute (M.S.) governing watershed districts (M.S. 103D). This plan was revised in accordance with the Metropolitan Surface Water Management Act of 1982 (M.S. 103B). The revised plan was adopted by the District in 1989. Minnesota Statues 103B and 103D both require the District to revise the water resources management plan at least every ten years. A new plan was written and adopted by the District in 1999, with updates in 2002, 2003 and 2006.

5.1.1 Watershed Districts

The Watershed Act (M.S. 103D.201) contains the following declaration of general policy:

In order to carry out conservation of the natural resources of the state through land utilization, flood control and other needs upon sound scientific principles for the protection of the public health and welfare and provident use of the natural resources, the establishment of a public corporation (watershed district), as an agency of the state for the aforesaid purposes, is provided.

Under the provisions of the above policy, a watershed district may be established for any or all of the following conservation purposes: protection or enhancement of water quality; prevention and alleviation of flood damage; prevention and alleviation of soil erosion and sedimentation; regulation of streams, lakes and water courses for domestic, recreational and public use; and protection and regulation of groundwater uses.

Under the Metropolitan Surface Water Management Act for watershed organizations within the Twin Cities metropolitan area, the following purposes also apply: reduce to the greatest possible extent the public expenditures necessary to control excessive volumes and rates of runoff; protect and preserve natural surface and groundwater storage and retention systems; identify and plan for means to improve water quality, prevent flooding and erosion from surface flows; promote groundwater recharge; protect and enhance fish and wildlife habitat and water recreation facilities; and secure the other benefits associated with the proper management of surface water.

Under Minnesota Statues, watershed districts are given specific powers and authorities, including the authority to: collect data, conduct studies and investigations; construct improvements; levy property taxes; adopt rules to regulate, conserve and control the use of water resources; enter into contracts, hire staff and consultants, acquire property and incur debts; and enter lands for surveying and investigation.

See Minnesota Statutes 103B and 103D for more information regarding the statutory purposes, requirements and authority of watershed districts.

5.1.2 Comprehensive Water Resources Management Plans

To ensure that the objectives of watershed districts are realized, Minnesota Statutes 103B and 103D require that watershed districts adopt comprehensive water resources management plans, submit the plan to local governments, hold a public hearing and periodically revise the plan. Minnesota Statutes 103B.231 and 103D.401 further specify the basic contents of the water resource management plan. According to the law, the plan shall:

- Describe the existing physical environment, land use, and development in the area as well as the environment, land use, and development proposed in existing local and metropolitan comprehensive plans.
- Present information on the hydrologic system and its components, including any drainage systems previously constructed under M.S. 103E and existing and potential problems related thereto.
- State objectives and policies, including management principles, alternatives and modifications, for protecting water quality, and protection of natural characteristics.
- Set forth a management plan, including the hydrologic and water quality conditions that will be sought and the significant opportunities for improvement.
- Describe the effects of the plan on existing drainage systems.
- Describe conflicts between the watershed plan and existing plans of local government units.
- Set forth an implementation program consistent with the management plan, including a capital improvement program; standards and schedules for amending the comprehensive plans; and official controls of local government units in the watershed to bring about conformance with the watershed plan.
- Set out and delineate a procedure for amending the plan.

5.2 DISTRICT FORMATION

The Prior Lake-Spring Lake watershed is approximately 42 square miles in size and is located in north central Scott County, Minnesota, encompassing parts of the cities of Prior Lake, Shakopee, and Savage and parts of Sand Creek and Spring Lake Townships. In addition, Mdewakanton Sioux Community Tribal Lands are located within the watershed.

The District was established on March 4, 1970 by order of the Minnesota Water Resources Board (MWRB) under the authority of the Minnesota Watershed Act (Minnesota Statutes, Chapter 112).

The order was in response to a petition filed with the MWRB by resident freeholders within the watershed on June 24, 1969.

This petition sought establishment of the District for the general purposes of conserving the waters and natural resources of the watershed by controlling and maintaining lake water levels; preventing and controlling pollution; promoting and improving the recreational uses of the watershed's lakes including, but not limited to, the construction and maintenance of fish-rearing ponds; the regulation and control of cesspools and waste disposal; and to provide methods of draining flooded farm areas by construction and regulation of drainage ditches. The petitioners also sought to develop projects to alleviate damage by floodwaters and control erosion of land. Other general objectives were reclamation of wet and overflowed lands, regulation of stormwater disposal, maintenance of water quality in the lakes and watercourses of the watershed, and provide an organization to manage the watershed in an orderly manner.

After receiving evidence from the residents in the area at a public hearing on December 8, 1969, the MWRB found that the petition fairly represented the problems of the watershed, and that the establishment of a watershed district was necessary and desirable as a means of studying and implementing the changes necessary to solve the problems as outlined in the petition.

5.3 ORGANIZATION AND ADMINISTRATION

5.3.1 Board of Managers

The activities and policies of the District are administered by a five-person board of managers appointed by the commissioners of Scott County. Board members are appointed for staggered three-year terms, and there is no term limit. Watershed district managers must be voting residents of the watershed district and must fairly represent various hydrologic areas within the watershed district. Mangers cannot be public officers of the county, state or federal government and cannot be staff of the local units of government. The District's policies, objectives, and historical accomplishments have been directed by the people who have served on the Board of Managers (Table 5-1).

Table 5.1. Prior Lake-Spring Lake Watershed District Managers.

Name	Term
Robert Peterson	04/04/70 to 03/18/80
Gerald Sandey	04/04/70 to 03/15/82
Milo Moll	04/04/70 to 03/03/76
Emmett Knox	04/04/70 to 04/18/78
Luke Youngvorst	04/04/70 to 04/18/78
Cleve Mickley	03/04/76 to 04/14/87
Richard Heinz	03/09/76 to 04/14/87

Name	Term
Clarence Anderson	04/18/78 to 03/14/84
Harold Gustafson	06/17/80 to 11/09/88
Marvin Oldenburg	03/03/83 to 11/07/94
James Laabs	03/04/84 to 03/03/96
Ronald Kroyer	05/14/85 to 03/03/88
Andrew Franklin	06/09/87 to 07/10/90
Robert Adams	02/14/89 to 10/12/93
Gerald Meysembourg	02/12/91 to 10/24/95
Elizabeth Erickson	03/04/91 to 05/11/99
David Moran	12/14/93 to 01/09/03
Ken Conrad	03/03/95 to 09/10/96
Craig Gontarek	10/24/95 to present
Larry Mueller	06/11/96 to present
Orlin Schafer	12/10/96 to 02/13/01
Chris Olson	09/14/99 to 01/09/01
William Kallberg	03/13/01 to present
Roger Wahl	07/10/01 to 07/11/10
William Schmokel	02/11/03 to present
Greg Aamodt	07/12/10 to present

5.3.2 Staff and Consultants

Under the Minnesota Watershed Act, the District is responsible for managing the water resources within its boundary, a job that includes preparing overall plans, collecting data on water quality and quantity, regulating water resources impacts, and coordinating water resources projects. To complete this work, the District employs staff. Staffing levels will be adjusted as needed according to program activities. The District also retains consultant services for specific technical expertise that the District is unable to obtain internally or through cooperative agreements with local governments. These services include, but are not limited to, engineering, legal, and accounting services.

5.3.3 Public Involvement

For this plan, an independent Citizens Advisory Committee was established to work in concert with a Technical Advisory Committee. The committees addressed the goals and focus areas of the plan. Participants were contacted and informed by public notices filed with the *Prior Lake American* newspaper and other published materials generated by the District. Each unit of government was approached on multiple occasions for inclusion on the technical committees.

As the plan is implemented, the Managers hope their policy of conducting public meetings prior to ordering projects will involve additional single issue citizens in the process. With the exceptions

of the District's outlet channel and Eurasian water milfoil project, there have not been issues which have generated sizable community interest in the areas of water quality and quantity. The Managers believe public interest will be generated with the success of ongoing Prior and Spring Lake water quality improvement projects. More information on the Managers' policy for continued public involvement and subsequent plan amendments are included in Section 9.

5.4 DISTRICT OPERATIONS

5.4.1 Programs

The District is a mix of both suburban developed land, and agricultural undeveloped land. The District anticipates an increase in the amount of developed land within the District in the future. While this development brings many positive benefits and opportunities to the area, if not handled carefully it can create problems with water resources. Development and other land-altering activities can affect the amount of runoff in the District (both rate and volume) and degrade the quality of that runoff. If left unmanaged, runoff stresses our streams, ages our lakes, and degrades and eliminates our wetlands.

5.4.1.1 Rules and Permitting

To address development and redevelopment concerns, the District developed rules and standards to protect public health, welfare and natural resources by regulating the improvement or alteration of land and waters within the District. The rules and standards are designed to accomplish the following goals:

- Reduce the severity and frequency of high water.
- Preserve floodplain and wetland storage capacity.
- Improve the chemical and physical quality of surface waters.
- Reduce sedimentation.
- Preserve the hydrologic and navigational capacities of water bodies.
- Promote and preserve natural infiltration areas.
- Preserve natural shoreline features.

All land disturbing activities, whether or not they require a permit, are to be undertaken in compliance with the standards and criteria of these rules and with best management practices.

The District implements its rules and standards in part through a permitting program for new and redevelopment. A permit is required for all land disturbing activities within the District that will disturb more than 10,000 square feet of land in shoreland protection zones (i.e. near a lake, wetland or the outlet channel of Prior Lake), or one acre of land elsewhere. Some of the local governments with land in the District have established permitting programs and adopted regulatory standards that are equivalent to the District’s rules and standards, and through Memoranda of Agreement

with the District land disturbing activities in those jurisdictions do not have to acquire a separate permit from the District. These agreements are discussed further in Section 8. Land disturbing activities in jurisdictions where no equivalency MOA is in place, or which will be affecting District owned land or easements are still required to be permitted through the District.

5.4.1.2 Outlet System Management

Outlet System Management exists to ensure appropriate lake levels on Prior Lake and to maintain the integrity of the Prior Lake Outlet Channel for the conveyance of both discharge from Prior Lake and for stormwater runoff from the Cities of Prior Lake and Shakopee and the Shakopee Mdewakanton Sioux Community. This program encompasses monitoring of the water levels on Spring and Prior Lakes, monitoring of precipitation within the District, and the stabilization of the Prior Lake Outlet Channel. The Prior Lake Outlet Channel improvement project is a cooperative effort between the Cities of Prior Lake and Shakopee, the Shakopee Sioux Mdewakanton Sioux Community, and the District. A copy of the Joint Powers Agreement for this project is available for review at the offices of the signatories.

5.4.1.3 Volume Mitigation

The District's volume mitigation efforts focus on identifying opportunities for increasing the water storage and improved runoff management practices in the watershed, and providing incentive payments and other options for achieving those increases. These efforts range from acquiring easements over high-priority wetlands to ensure their continued protection, promoting the installation of filter strips along ditches and streams, and restoring and enhancing drained wetlands. These efforts have the added benefits of protecting water quality and improving wildlife habitat, as well.

5.4.1.4 Water Quality Protection and Improvement

The District supports a variety of water quality protection and improvement projects. The District has an active monitoring program which includes monitoring water quality on Fish, Spring, Upper Prior, Lower Prior and Cates Lakes, as well as County Ditch 13 and other stream sites as determined by the monitoring plan. The District has a Ferric Chloride treatment system upstream of Spring Lake. This system removes phosphorus from the water before it reaches the lake. The District also engages in additional water quality improvement projects as they are available and effective, such as wetland enhancement projects, cost share funding for homeowner installation of rain gardens and shoreland restoration, and implementation of lake management plans.

5.4.2 Program and Project Funding

In accordance with the policy of the District to "administer programming in a fiscally sound manner," as stated in Section 2 – Goals and Policies, the District maintains various sources of funding for programs and projects. The District obtains its funds in three main ways: property tax levy, grant funds, and local cost sharing. The District also engages in bonding for special or large scale projects. The District may also explore the option of utilizing MN Statute 103D.729 (Water Management Districts) as a project funding mechanism.

5.4.2.1 Property Tax Levy

Under statutory authority, the District has the ability to collect taxes. The District uses an ad valorem tax (a uniform tax on all taxable parcels within a jurisdiction based on property values) to tax parcels within the District based upon the District's legal boundaries. The District strives to maintain a low to reasonable tax rate so that most taxpayers will see minimal increase in the Watershed District proportion of their property tax.

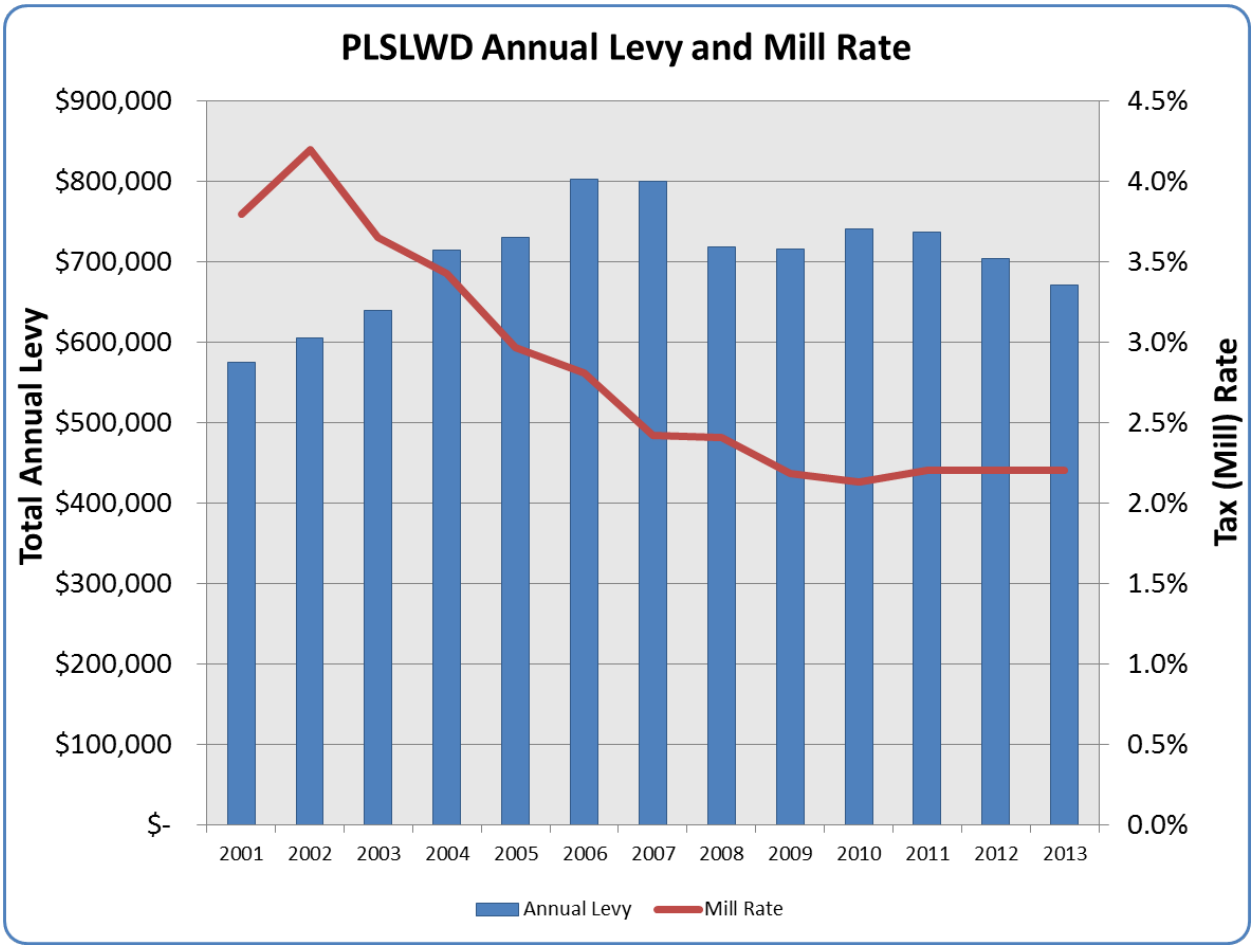

Figure 5.1. Prior Lake-Spring Lake Watershed District Levy 2001-2013.

5.4.2.2 Grant Funds

Grants make up a small portion of the District's funding sources. The District will continue to seek grant opportunities as a means to offset project costs whenever possible. However, the District recognizes that grant funding and priorities change frequently and will thereby not rely upon future grants for budgeting purposes.

5.4.2.3 Local Cost-Share Funding

In order to maintain efficiency and prudence in its spending, the District will continue to actively seek partnerships with local government units for cost-sharing on programs and projects. The District will also engage in efforts to partner with local government units when seeking assistance with technical services, thereby reducing the cost of hiring consultants. Conversely, where appropriate the District will consider cost-sharing on local projects where District goals can be achieved more cost-effectively than if the District undertook a similar project. Section 4 outlines several cost-sharing programs proposed to be implemented over the ten years of this plan.

More information regarding the fiscal responsibility of the District can be found in the District's Annual Report or Annual Audit. These documents and others are available for review at the District office.

5.5 DISTRICT RESPONSIBILITIES

In holding to its mission statement and goals, the District strives to work cooperatively and efficiently with local stakeholders. In order to maintain effectiveness, the District needs to understand and define its roles and responsibilities in relation to other units of government and other entities. In general, the District is responsible for addressing water resource management issues that affect more than one municipality within the District or any issues of which it determines are of District wide significance. As a part of its water resource management role, the District strives to maintain open avenues of communication and collaborative relationships with local government units.

5.5.1 Assistance to Local Governments

The District looks to local governments to address water resource management issues that are primarily local in nature or have a focus on enhancing recreational opportunities. The District will continue to provide assistance and support as available in the areas of water quality, natural resources and wetlands management. The District will also continue to work with local governments in the preparation of their local water management plans. More information regarding requirements, review and approval of local water management plans can be found in Section 8.

5.5.2 Permit Compliance

The District is the primary operator of a few stormwater facilities including the Prior Lake Outlet Channel and the Ferric Chloride Water Treatment Facility; both of which have NDPES permits. The Prior Lake Outlet Channel has a NPDES Phase II Municipal Separate Storm Sewer System (MS4) permit, while the Ferric Chloride Water Treatment Facility has a NPDES general permit to discharge. On occasion, the District also obtains project specific permits from relevant authorities. The District will continue to conform to the requirements of all permits issued to it. Copies of permits issued to the District as well as a copy of the District's Storm Water Pollution Prevention Plan can be obtained at the District office.

5.5.3 Collaboration with Agencies and Organizations

As indicated in Section 2, Goals and Policies, the District strives to maintain cooperative relationships with local government units. The District currently engages in agreements to assist or collaborate with local government units, adjoining watershed management organizations and other interested groups to address issues of mutual interest. The District expects that these collaborations and partnerships will continue and expand in the future.

SECTION 6 - EXISTING AND FUTURE CONDITIONS

6.1 INTRODUCTION

This section of the Water Resource Management Plan is an inventory of existing conditions and proposed future development within the Prior Lake-Spring Lake Watershed District. This section is divided into three main subsections: Physical Environment, Biological Inventory, and Human Environment. The Physical Environment subsection provides a general physical description of the watershed and describes the geomorphology, geology, and soils. The Biological Inventory subsection summarizes the major biological communities and inventories important plant and animal species. The Human Environment subsection describes land use and growth patterns, recreational resources, and potential environmental hazards. All maps referenced in this section appear in Appendix B: Reference Maps.

6.2 PHYSICAL ENVIRONMENT

The physical characteristics of a watershed include its physical setting, geology, geomorphology, soils, and water resources. Each of these topics is discussed in this section except for water resources which is the focus of Section 7 of this plan.

6.2.1 Physical Setting

The Prior Lake-Spring Lake Watershed District includes approximately 42 square miles of area located entirely within Scott County, Minnesota. The Vicinity map and the District map show the District boundaries; the surrounding area is shown for location reference. The District encompasses land in five local units of government; the Cities of Prior Lake, Savage, and Shakopee, as well as Sand Creek and Spring Lake Townships. The Municipalities map shows the boundaries of the District as well as the municipal boundaries of these five local governmental units. The City of Prior Lake and Spring Lake Township comprise most of the District's area, while Sand Creek Township and the cities of Shakopee and Savage have relatively little land area within the District.

There was no outflow from the watershed until 1983 when an outlet channel was constructed beginning at the southwest end of Lower Prior Lake. With the outlet channel in place, drainage flows north under County Road 21, through Jeffers Pond, Pike Lake, Deans Lake, and Blue Lake before its eventual discharge to the Minnesota River near the Old Highway 18 Bridge.

The Prior Lake-Spring Lake Watershed District is bordered by the Lower Minnesota River Watershed on the north, and the Scott County Water Management Organization (WMO) on all other sides.

6.2.2 Geology and Geomorphology

The surficial geology of the District is almost entirely comprised of glacial till deposits. The only surficial geological unit of any other origin is a few small regions of peat deposits. Glacial till and drift were brought to the region through a series of glaciations coming from the northeast and the northwest. The Superior lobe came from the northeast bringing reddish-brown drift, eroded from the bedrock of the Superior region. Glaciers coming from the northwest brought gray clayey, calcareous drift eroded from North Dakota, Manitoba, and Northwestern Minnesota. The hills, ridges, and kettle lakes of the region were formed when the Des Moines Lobe began to stagnate and melt. This resulted in the creation of the irregular topography of the region. The Surface Geology map shows the surficial geology of the District.

The bedrock in the District consists of steep-walled valleys and rolling plateaus. These bedrock formations are now covered by as much as 500 feet of glacial till. A major feature of the bedrock in the District is a large valley running from southwest to northeast through the watershed. The bedrock formations in this valley are progressively older in origin as they move to the center of the valley. The Bedrock Geology map shows the bedrock geology of the District.

Additional and more detailed information may be found in the MN Geologic Atlas of Scott County at ftp://mgssun6.mngs.umn.edu/pub3/c-17/.

6.2.3 Soils

Over time, the parent geologic material formed a variety of soils types within the watershed. Factors that influence soils formation include vegetation, parent material, age, topographic relief and climate. Six major soil associations have been identified in the District. A small portion of Kilkenny-Hamel-Lerdal association is found in the southern portion of the District between Sutton and Fish Lakes. The Lester-LeSueur-Cordova association is generally found around Lydia and Sutton Lake. The Lester-Hamel-LeSueur association is generally found south of Spring Lake, west of the Buck Lake channel. The Lester-Hayden-Muskego association is located from County Road 42 west of County Road 21 south to Fish Lake. The Lester-Hawick-Terril association is found around Lower Prior and Pike Lakes. The Sparta-Estherville-Waukegan association is found at the far northern end of the District on a terrace above the Minnesota River. These soil associations are shown in the Soils map. Additional information on soil types within the District can be found in the Scott County Soils Survey (SCS 1959), available from the Natural Resource Conservation Service.

6.2.4 Groundwater

Groundwater is comprehensively addressed in the 1999 Scott County Groundwater Protection Plan and has been updated and incorporated into the Scott County 2008 Water Resources Plan. The District will support efforts in accordance with the county groundwater plan whenever possible.

This plan incorporates by reference the 1999 Scott County Groundwater Protection Plan and the 2008 Scott County Water Resources Plan and any successor plans.

6.3 BIOLOGICAL INVENTORY

This section describes the biological communities that are characteristic of the District. This section also highlights important, rare and endangered species and habitats which may be found in the District. Water resources management policies established in this plan are intended to give consideration to the protection of these rare and endangered species and habitats.

6.3.1 Presettlement Vegetation

The Prior Lake-Spring Lake Watershed lies within the North Central Hardwood Forest Ecoregion, and more specifically, the Big Woods subecoregion. This region is defined by a single landform that was once dominated by oak woodland and maple-basswood forests. Few remnants of the original vegetation remain as a result of agricultural and urban development. The presettlement vegetation for the watershed is presented in the Presettlement map. This map shows that although the Big Woods dominated the watershed vegetation, other communities such as prairie, wet prairie, aspen-oak land, and oak opening-barrens were present as well.

The historical prairie area within the watershed was found primarily south and east of Prior Lake. Tall prairie grasses flourished within this area with low shrubs interspersed. This area of the watershed was settled first because it was the easiest to clear. This area is now represented by the core of the City of Prior Lake.

Aspen-Oak lands bordered the prairie to the south and ran nearly to Fish Lake. The vegetation community of Aspen-Oak lands was the first to invade prairie areas. The aspen invasion was followed by invasion of the Big Woods, which was comprised of oak, elm, maple, basswood, hornbeam, aspen, birch, wild cherry, hickory, butternut, and black walnut. Below the tree canopy, numerous shrubs often grew relatively dense. In areas where the tree canopy provided considerable shade, a wide variety of herbaceous plants replaced the shrub growth. Aspen areas were typically settled before the Big Woods because these areas were easier to clear.

A small region of Oak Openings and Barrens, also called Oak Savannah, was present near the northeast corner of the watershed. This community is characterized by isolated oak trees surrounded by low shrubs and grassy expanses.

Historical wet prairies, or wet meadows, were found in two bands running south from Spring Lake. These wet prairies generally followed major natural drainage features which still exist today: County Ditch 13 and the Buck Lake Channel. The aquatic wetland community within the wet prairie areas was one of the most complex and diverse communities in the region. Wetlands represented in these areas represented a variety of hydrologic regimes from seasonally inundated wet meadows (Type I Wetlands) to Lakes (Type V Wetlands). The variation in hydrologic regimes

is mirrored in the plant community with wetland plants ranging from facultative wetland plants that grow near wetland boundaries, to obligate wetland plants such as cattails and floating and submerged aquatic vegetation. Wetlands will be further discussed in Section 7, Hydrologic Systems, and are shown in the Wetlands map.

6.3.2 Wildlife Areas

There are no state-managed wildlife areas within the District. However, the Prior Lake Outlet Channel passes through a portion of the Minnesota Valley National Wildlife Refuge before ending at the Minnesota River. This area is managed by the US Fish and Wildlife Service according to its management plan.

6.3.3 Rare and Endangered Species and Habitats

The Minnesota DNR's Natural Heritage Program was consulted to determine where areas potentially containing rare and endangered species and habitats may be located within the District. The Rare and Endangered Species map shows the general location of the rare and endangered species and habitats for the Prior Lake-Spring Lake Watershed.

Two regions of maple-basswood forests are located in Spring Lake Regional Park on the north side of Spring Lake. This forest cover type occurred over much of the Twin Cities Metropolitan Area prior to European settlement; however, due to subsequent agricultural and urban development few remnants of this community exist today. In addition to the two occurrences of maple-basswood forests in Spring Lake Regional Park, four other occurrences are listed for the watershed; one east of Mystic Lake, one just north of Hass Lake and two small locations near Sutton Lake.

Two other occurrences of rare species are listed as occurring near Spring Lake Regional Park. These species are *Desmodium cuspidatum var. Longifolium*, Big Tick-trefoil, a rare woodland legume and *Emboidea blandingii*, the Blanding's turtle. Habitat destruction has significantly affected the populations of these species throughout the region. *D. cuspidatum* is found in native woodland habitat, while the Blanding's turtle typically prefers shallow wetlands with adjacent uplands for nesting. It is likely that this species inhabits the marshes within or adjacent to the park and utilizes the forested uplands during the nesting season.

Other potential locations of endangered species include wetlands near the northeastern shore of Upper Prior Lake which may hold a population of Blanding's turtles and a red-shouldered hawk's nest located east of Prior Lake near Candy Cove. The red-shouldered hawk requires large forested tracts (about 500 acres) interspersed with small marshes and wet meadows for breeding. Conservation actions to minimize the disturbance of the remaining forest/wetland complex southeast of Prior Lake are recommended by MN DNR to protect the breeding habitat of this rare woodland hawk. There is also a small Sphagnum rich fen located west of Highway 13 between County Roads 16 and 42.

6.4 HUMAN ENVIRONMENT

This section of the inventory is divided into three subsections; Land Use, Recreational Resources, and Potential Environmental Hazards. The Land Use subsection describes the historical background, current and future land uses, as well as the extent of metropolitan services. The Recreational Resources subsection discusses the regional parks, boat landings, regional trails and other recreational facilities in the watershed. The Potential Environmental Hazards subsection describes areas that have potential pollutant sources to surface or groundwater such as hazardous material handlers, landfills, feedlots and other potential pollutant sources.

6.4.1 Land Use

6.4.1.1 Historical Background

The earliest European settlers in the Prior Lake-Spring Lake Watershed arrived in 1853. These early settlers resided south of Spring Lake in what was to become Spring Lake Township.

The first annual town meeting for Spring Lake was held May 11, 1858 at the house of W.H. Calkins. Spring Lake Village was originally surveyed and recorded in 1857. A considerable number of lots were sold as the town rapidly grew. A grist mill was built at the outlet of Spring Lake in 1859, the first store in Spring Lake Village was built in 1865 and there is also a cemetery which was laid out and recorded in 1863. Following the construction of the Hastings & Dakota Railway the town saw a general decline.

Prior Lake Village was surveyed and recorded in 1875 on land owned by C.H. Prior. The first building erected in Prior Lake was a store built in 1871. The Prior Lake post office was established in 1872, and by 1882, the Prior Lake business district had expanded to include one flour and feed mill, one general merchandise store, one wheat storehouse, one blacksmith shop, and two saloons. The Grainwood Resort opened up on the lake in 1879, followed by several other smaller resorts; Fish Point (1907); Grainwood Landing (1906-1910); and Spranks Resort (1910-1940).

By 1940, Spring Lake had 59 cottages, 5 resorts, and more than 125 boats used for fishing, boating and other recreational purposes. Lower Prior Lake had 90 cottages and 2 resorts and more than 150 boats (Minnesota Department of Conservation 1940).

6.4.1.2 Present Land Use

Land use within the District reflects five basic location mechanisms: proximity to Minneapolis and St. Paul, proximity to transportation, proximity to Prior and Spring Lakes, availability of wastewater service, and local controls. The Existing Land Use map presents the existing land uses for the District.

Existing land uses within the District include both urban and rural land use types. Urban developments are primarily residential units located adjacent to the lakes with some commercial and industrial development primarily occurring along Highway 13 through the City of Prior Lake. The predominant residential land use is single family residential units. Commercial and industrial land use in the watershed is comprised of warehousing, residential services, and office space. Rural land use is primarily comprised of small to medium sized farms with the average farm size being about 150 acres. The major farming activities include row crop production of corn and soybeans along with a few cattle grazing in pastures. The agricultural areas of the District are primarily located in the southern part of the District away from Prior and Spring Lakes and outside the Metropolitan Urban Service Area (MUSA).

The MUSA map, as shown in Appendix B, presents the current MUSA boundaries for the District. Metropolitan Council Environmental Services (MCES) operates all of the regional wastewater treatment facilities for the Greater Twin Cities Metropolitan Area. As the wastewater authority, MCES establishes the limits of the MUSA boundary. Within this boundary residents and businesses receive municipal services. Outside this boundary, residents and businesses must rely on on-site wastewater treatment systems. As a result, the MUSA boundary determines in a large part the extent of urban development. Comparing the MUSA boundary map to the existing land use map reveals the close connection between urban development and the availability of waste water services.

6.4.1.3 Future Land Use

Under the Metropolitan Land Planning Act, the communities within the District were required to prepare and submit land management plans with projections of future land use. Appendix B shows the Future Land Use map, which is a compilation of proposed future land use by the municipalities within the District.

Recent trends in land use patterns for the District indicate that residential development is spreading out from the core area around Prior and Spring Lakes into adjacent areas. Population of the City of Prior Lake has more than doubled since 1980, with 2007 population estimates at 22,111. Population estimates for Scott County by the Metropolitan Council and State Demography Unit estimate 2007 populations at 123,735 people. Agriculture has experienced a modest decline in cropland acres and in the number of farms. However, much of the soil within the District is classified by the Natural Resource Conservation Service as good farmland, with an area around Sutton Lake being classified as prime agricultural land. These agricultural areas are also the least affected by the most common development. (These areas are furthest away from the Metropolitan core cities; they are furthest away from the highly desirable recreational lakes, and outside of the MUSA.) Therefore, it is expected that agricultural land uses will continue to remain present within the District although pressure of urbanization is increasing dramatically. Commercial agriculture is becoming less viable as seen in the increase in cluster or large lot subdivisions.
Land use information for the District was obtained from land management plans prepared by the local municipalities and by the County. For more detailed information on land use, refer to the

city land use plans prepared by the Cities of Prior Lake, Savage, and Shakopee. For areas outside of these municipalities, land use information is provided by Scott County. The county land use plan appears as a portion of the Scott County 2030 Comprehensive Plan, adopted in 2008.

6.4.2 Recreational Resources

Land and water-based recreational opportunities exist within the District. Water based recreation in the District is primarily focused on Spring, Upper Prior, and Lower Prior Lakes. There are numerous parks within the District, the largest of which is Spring Lake Regional Park, located on the north shore of Spring Lake and covering about 400 acres. Lake Front Park is the second largest park facility and is located on the southeast shore of Lower Prior Lake within the City of Prior Lake. Jeffers Pond Park is the third largest park facility, covering 147 acres and including both Upper and Lower Jeffers Ponds. Locations of park and boat launch facilities in the District are shown on the Recreational Resources map.

Public boat landings within the District include on each on Fish, Spring, Upper and Lower Prior Lakes. These landings are maintained by the DNR. There is also one winter access point on both Spring and Lower Prior Lakes.

Spring, Upper Prior, and Lower Prior Lakes have a combined surface area of approximately 1,800 acres. These lakes receive intense recreational pressure year round. Open water activities include fishing, boating, water skiing, jet skiing, sailing, wake boarding, and swimming. During the winter when the lake is ice covered, recreational activities include snowmobiling, ice fishing, skating, and cross country skiing.

Three established swimming beaches exist within the District: Sand Point on the north shore of Lower Prior Lake and Watzl's Point at the southeast end of Lower Prior Lake. According to the City of Prior Lake, annual visitors to Sand Point and Watzl's Point range from about 30,000 to 48,000 and 9,000 to 12,500, respectively. A swimming beach also exists on Fish Lake within the Fish Lake campgrounds area.

6.4.3 Potential Environmental Hazards

This section will address potential environmental hazards. It will highlight feedlots, septic systems, known industrial and hazardous waste sources and highly erodible soils. There are no sanitary landfills or open dumps within the District. Abandoned wells, permitted wastewater discharges, and storage tanks are not addressed here as they are covered in detail in the Scott County Water Resources Plan (2008).

6.4.3.1 Feedlots

All feedlot information was obtained from the Scott Soil and Water Conservation District (SWCD). Currently operating feedlots are subject to field inspections and given surface water pollution potential ratings of high, medium, or low relative to the number of animals present, current condition of the feedlot, land slope, and proximity to surface waterbodies. The number of feedlots in the District has decreased from 18 feedlots in 1999 to 11 feedlots in 2008.

6.4.3.2 Septic Systems

The status of on-site septic systems was investigated by contacting Scott County. Most of the City of Prior Lake is connected to sanitary sewer. The jurisdiction for the City encompasses both Upper and Lower Prior Lakes. Most of Spring Lake is in the orderly annexation area for the City, thus services may be extended to areas surrounding Spring Lake in the future.

Currently, most of the area south of Spring Lake is in Scott County's jurisdiction. Scott County inspects septic systems during installation and tracks the pumping frequency for each system in the county. If a system is pumped three times in one year, the county sends the owner a letter informing them that their system may be failing. The county currently does not have the staff to inspect for failing systems and generally identifies failing systems by complaints. It is estimated that 15 to 20 failing systems are found and corrected countywide each year.

Impacts to lakes from septic systems will be potentially greatest surrounding Spring Lake, however between the Orderly Annexation Agreement with the City of Prior Lake and the County's system of tracking system pumping, septic system inputs are not currently considered a significant problem for the District.

6.4.3.3 Industrial and Hazardous Waste Sources

Many commercial and industrial sites may act as sources of a wide variety of pollutants including many hazardous pollutants such as heavy metals or organic chemical compounds. A search was conducted via the US EPA Enforcement and Compliance History Online database and 65 sites were identified. This search included auto salvage facilities, hazardous waste sites, medical facilities, and other facilities holding permits to generate, emit, discharge or handle pollutants. Auto salvage yards, machine shops, and medical facilities are the most common and are frequently sources of heavy metals such as lead, zinc, copper, and chromium as well as oil and grease.

6.4.3.4 Highly Erodible Soils

Highly erodible lands (HEL) are a potentially important pollutant source. A study of HEL soils was conducted by the watershed in cooperation with Scott SWCD in 1993 as part of the Prior Lake-Spring Lake Diagnostic/Feasibility Study. Detailed information regarding HEL soils is available at the District office. Information used to assess the soils in the watershed included the

Scott County Soil Survey, the HEL map unit list compiled by the Scott SWCD, and the Scott County section maps. Ten soils series in Scott County were identified as being potentially highly erodible, six of these soil series occur within the District. This study focused on the southern part of the watershed, as this is where most of the agriculture land use is located. Soil erosion in the urban area of the watershed is expected to be minimal except during periods of construction.

This study found that approximately 3,410 acres of 14,550 acres evaluated were potentially highly erodible. This corresponds to approximately 23 percent of the southern watershed. The allowable soil loss, or T factor, as specified by Scott SWCD is 5 tons/acre/year.

In addition to soil series and slope, soil loss rates are also dependant on the crop rotation & residue management implemented. The 2007 National Resource Inventory completed by the USDA-NRCS states an average soil loss rate of 4.6 tons/acre/year for Minnesota (and Wisconsin) cropland. Soil loss rates on HEL soils, however, are often higher. For instance, soil loss rates for LcD2 (a common HEL soil) can be approximately:

- 11 tons/acre/year for corn-soybean rotation with non-conservation tillage (conventional)
- 7 tons/acre/year for corn-soybean rotation with conservation tillage

Reducing the soil loss rates in the watershed will not only reduce sediment loading to the surface waters of the District, but it will also reduce associated particulate pollutants such as phosphorus and nitrogen that may be sorbed to the eroded soil. In 1994 the District purchased a no-till drill and in 1998 donated it to the Scott SWCD for rent to farmers in the watershed. It is hoped that by promoting no-till farming that soil losses in the watershed can be reduced.

SECTION 7 - HYDROLOGIC SYSTEMS

7.1 INTRODUCTION

This section of the water resources management plan is an inventory of basic hydrologic data for the Prior Lake-Spring Lake Watershed District. The inventory is divided into four subsections: precipitation, water quantity, water quality, and groundwater. All tables and figure for this section appear in Appendix H.

7.2 PRECIPITATION AND DRAINAGE

Snow and rainfall data for the District is obtained from a weather station at Jordan, Minnesota. Over 50 years of precipitation data has been collected and is summarized in Table 7-1, shown in Appendix H. These stations are used by the District because of their proximity, their long period of record, and the high degree of confidence in the data. Additional precipitation records can be obtained from local sites through the state's volunteer precipitation monitoring network overseen by the state climatologist.

Historically, excessive wet and dry years have resulted in water level problems in parts of the District, most notably on Upper and Lower Prior Lakes. Figure 7-1, shown in Appendix H, presents the ten year historical record of precipitation at the Prior Lake-Spring Lake Watershed District site.

7.2.1 Precipitation and Evaporation

Rainfall frequency and duration information for the metropolitan area is commonly taken from the United States Department of Commerce's Weather Bureau Technical Paper No. 40 (TP-40). This paper used data from the Minneapolis-St. Paul International Airport, but due to the "low" rainfall amounts recorded at the airport and the fact that the report is now over 30 years old, several additional references are also available. These include the Metropolitan Council's *Precipitation Frequency Analysis for the Twin Cities Metropolitan Area* (January 1989) and Illinois State Water Survey's *Rainfall Frequency Atlas of the Midwest* (1992), the DNR Climate Website, and the Minnesota Climatology Working Group website.

During recent droughts, the issue of lake augmentation arose as lake levels declined. The annual average evaporation for this area is approximately 30 inches of water per year (Table 7-2). When rainfall is below average, lakes with small tributary areas can drop rapidly. In the absence of specific evaporation data, these values can be used to estimate future lake levels and recovery times for lakes when combined with observation well data and hydrology models.

7.2.2 Topography

The hydrologic system of the District is characterized by its drainage features including ditches, streams, floodplains, wetlands, and lakes. Topography and drainage patterns for the District are typical of glaciated areas. The terrain ranges from rolling hills to nearly level with numerous basins of glacial origin (such as kettle lakes) scattered throughout the District. The Subwatershed Map, shown in Appendix B, shows the major drainage features of the watershed including subwatershed boundaries, lakes, streams, and drainage ditches. Discussion of wetlands and floodplains are presented later in this section.

The highest ground in the watershed is 1,100 feet above mean sea level (MSL). This high ground is located along the eastern boundary of the watershed in Spring Lake Township (S23, T114N, R22W). The lowest ground in the watershed is the outlet channel at an elevation of approximately 880 feet above MSL. The shoreline of Prior Lake has varied historically depending upon the lake level. The elevation of Prior Lake has ranged from a recorded low of 883.6 in 1938 to a recorded high of 907.6 in 1906.

The major water features of the District are Spring Lake, Upper Prior Lake, and Lower Prior Lake. In general, water flows from southwest to northeast through the watershed. The southwestern portion of the watershed includes Swamp Lake, Sutton Lake, Fish Lake and Buck Lake. This region is drained primarily by County Ditch 13 for Swamp and Sutton Lakes and by the Buck Lake channel for Fish and Buck Lakes. These channels discharge to Spring Lake, which discharges to Upper Prior Lake, which in turn discharges to Lower Prior Lake.

There was no outflow from the watershed until 1983, when an outlet channel was constructed beginning at the southwest shore of Lower Prior Lake. With the outlet channel in place, drainage flows north under County Road 21, through Jeffers Pond, Pike Lake, Dean Lake and Blue Lake, before its eventual discharge to the Minnesota.

7.2.3 Floodplain

The United States Army Corps of Engineers and the Federal Emergency Management Agency have mapped the District's floodplains. The Floodplain Map, found in Appendix B, shows an approximation of the floodplains delineated by these agencies. These floodplains represent the area that would be inundated by a 100-year flood event. This map does not show all floodplains within the District and is in part, based on approximate hydrologic methods and limited topographical data. Refer to Flood Insurance Rate Maps (FIRM) for more detailed information. Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS) are available online via the Federal Emergency Management Agency interactive website, http://msc.fema.gov.

7.3 WATER BODIES

7.3.1 Public Ditches

County Ditch 13 is the only public ditch in the District. This ditch follows the path of the original natural stream for most of its length. However, this ditch was widened and straightened to increase its capacity to drain land for agricultural purposes. Scott County maintains maps of this system which differentiate the public ditch from private laterals/extensions, and natural drainage ways. The County controls the public ditches and is the ditch authority for the purpose of implementing M.S. 103E (Drainage Law).

7.3.2 Lakes

Approximately 8 percent of the District is covered by lakes. There are four lakes in the District that are greater than 100 acres in size and eight lakes with areas between 20 and 100 acres. The lakes that are greater than 100 acres and support fishing, swimming, and other body and non-body contact recreational uses are considered priority water bodies. These lakes are listed in Tables 7-3 and 7-4, with their major physical, chemical, and biological characteristics noted. Additional fishery and water quality data can be found in Appendix C and E.

7.3.3 Wetlands

DNR protected wetlands are defined in M.S. 105.37 as "all Type 3, 4, and 5 wetlands, as defined in United States Fish and Wildlife Service Circular No. 39 (1971 edition), not included within the definition of public waters, which are 10 or more acres in size in unincorporated areas or 2.5 or more acres in incorporated areas." Permits are required from the DNR for any alteration of protected wetlands or waters below the ordinary high water elevation. A detailed map and inventory list of DNR protected wetlands can be found in the 1996 DNR publication “Protected Waters and Wetlands, Scott County, Minnesota”.

The United States Fish and Wildlife Service (USFWS) has also compiled wetland maps through the National Wetland Inventory (NWI). The NWI maps identify wetland types 1-8, regardless of size, and therefore provide a more complete accounting of wetland areas. Detailed USFWS NWI maps can be found on the USFWS interactive Geospatial Wetlands Information website at http://www.fws.gov/wetlands/Data/Mapper.html. The District has chosen to use this interactive mapping tool, as opposed to a hard copy map, as it is the most up to date and allows flexibility in selecting data sets.

In 1994, Scott Soil and Water Conservation District (SWCD) conducted a detailed wetland inventory for the southern half of the District. Under this effort, the SWCD reviewed maps from the DNR, the Metropolitan Mosquito Control District, the United States Department of Agriculture, the United States Fish and Wildlife Service, and the United States Geological Service to identify existing wetlands, drainage areas for these wetlands, and drainage channels. Tile records were reviewed to obtain information on drained wetlands. Historical aerial photographs dating back to 1937 were also reviewed to identify original wetland areas. Field reconnaissance was used to complete the inventory by providing a field verification of the mapping results. The

maps and records from this wetland inventory are not included in this plan because the extensive detail of this inventory would make this plan excessively cumbersome. However, the inventory records and maps can be viewed at the District office.

The Wetland map, found in Appendix B, shows the general location of DNR protected wetlands in the District as determined by the Scott SWCD.

7.4 WATER QUANTITY

Water quantity has been identified as a priority issue for the District, both now and even more in the future as development continues throughout the watershed. A thorough understanding of water quantity issues is a major component of the watershed management plan. Water quantity issues can be divided into two categories: issues relating to the quantity of water stored and issues relating to the quantity of water flowing through a given point. This section summarizes and discusses data on water storage in terms of lake levels and flow data are also summarized and discussed.

To supplement the existing data on lake levels and flow, several hydrologic models have been developed for the District. These models serve as an important tool for analyzing the relative importance of various factors that influence water levels and flow rates. In addition, these models can be used to make predictions regarding future water levels and flow rates in the District. Various models have been used depending upon desired analysis parameters and include XP-SWMM, SWAT, HydroCAD and HEC-RAS. Details on modeling and model calibration can be found in individual project reports.

7.4.1 Lake Levels

The most comprehensive data on lake levels in the District are for Upper and Lower Prior Lakes. Because these two lakes are joined by a wide channel, water level readings for both lakes are essentially equal. Figure 7-2 shows the historic record of water level data for these lakes from 1970 to 2008 and Figure 7-3 shows a comparison of average annual lake level for Prior Lake and annual precipitation from 1998 to 2008. This figure shows that lake levels are significantly influenced by long-term rainfall patterns, although this linkage has been dampened by the construction of the lake outlet which moderates high lake levels and decreases the odds of successive high water years.

Lake levels for Upper and Lower Prior Lakes have historically been one of the most important issues in the District. Before 1983, Lower Prior Lake did not have an overland outlet. As a result, water levels in the lakes fluctuated widely depending upon rainfall patterns. Since the construction of the outlet channel, the lake levels have stabilized somewhat, but lake level conflicts still arise. When lake levels are high, water levels encroach on numerous dwellings, but when water levels are too low, water recedes from some shallow bays making boat access to the lake difficult. The number and location of dwellings potentially adversely affected at a given water level was documented in 1997 and 2003. Potentially affected low homes are listed in the 2003

Barr Engineering Company *Floodproofing and Buyout Study*, including information on low floor and low entry point of these homes.

Water level data for other lakes in the District is somewhat sparse compared to the data availability for Prior Lakes. Water level data are available for Fish and Spring Lakes, but limited data, if any, are available for other waterbodies in the District. All level data collected by the District has been sent to the DNR for inclusion in the Lake Finder information database.

Table 7-5 lists that ordinary high water (OHW) levels for lakes in the District. The OHW is defined in M.S. 103G.005 as

> "An elevation delineating the highest water level that has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial; for watercourses, the ordinary high water level is the elevation of the top of the bank of the channel; and for reservoirs and flowages, the ordinary high water level is the operating elevation of the normal summer pool."

The OHW is an important regulatory concept in that it defines the extent of the DNR protected public waters and wetlands. Any project that would alter the OHW or would occur below the OHW would require a DNR permit.

7.4.2 Flow Gauging

7.4.2.1 District Wide

Continuous flow gauging data for the watershed are limited. All of the flow data for the District have been collected as part of short-term special studies. The most accurate special study was conducted on County Ditch 13 (CD 13) in 1994 in support of Best Management Practice (BMP) implementation activities in the CD 13 subwatershed. Because 1994 was a near average rainfall year, the flow gauging results from this study are considered more typical than the flows gauged during other studies. Base flow for CD 13 is about 1-2 cfs, with observed peaks as high as 90 cfs. High flow periods for CD 13 include spring runoff from early-April to mid-May and then again during the late summer and early fall. This pattern, as one would expect, parallels the seasonal precipitation and runoff patterns of the region.

Additional stream flow data is necessary to adequately calibrate and verify the District's various hydrologic models and will be completed as determined in the District's monitoring plan. The Water Quality Monitoring map, found in Appendix B, shows the locations of monitoring stations from current and past water quantity and water quality studies.

7.4.2.2 Outlet Channel

Flow calculations for the outlet channel were integral to the development of the Joint Powers Agreement for the Construction, Use, Operation and Maintenance of the Prior Lake Outlet Channel. Additional details on modeling for this project can be found in the JPA document, which is available for review at the offices of the District, the Cities of Prior Lake and Shakopee and the Shakopee Mdewakanton Sioux Community. Additional monitoring of flows in the outlet channel will be completed by the District in accordance with the District's monitoring plan.

7.5 WATER QUALITY

Most of the existing water quality data for the District is primarily related to the trophic status of Spring, Upper and Lower Prior Lakes, although a few studies have also been conducted for Fish Lake. Water quality studies that have been conducted for these lakes are listed in the bibliography. Data for collection for District lakes have been more consistent since initiating monitoring through the Metropolitan Council's CAMP program in 2002. A permanent monitoring program is necessary to provide a current assessment of water quality and to identify possible water quality trends in a timely manner so that prompt management action can be taken. The District currently operates its monitoring program based upon a biannual monitoring plan. All data from District studies and monitoring has been made available to other organizations and individuals through the STORET database, which is managed by the MPCA.

7.5.1 Summary of Historical Lake Water Quality Data

As stated above, water quality data collection for the District has focused on trophic status related parameters for Upper Prior, Lower Prior, Spring, and Fish Lakes. These data include information on phosphorus, nitrogen, chlorophyll-*a*, suspended solids, dissolved oxygen, and Secchi disk transparency. Appendix E contains the most recent data collected via the MCES CAMP program.

7.5.1.1 Phosphorus

Phosphorus is an essential nutrient for algae and aquatic macrophyte growth and it is often the limiting nutrient for the growth of these plants. As a result the concentration of phosphorus is of particular concern in aquatic systems as its concentration often determines the abundance of algae and aquatic macrophytes. The overabundance of these plants results in numerous interrelated water quality problems that may adversely impact recreational, aesthetic, and fisheries uses of lakes.

Figure 7-4 shows the mean summer total phosphorus (TP) concentrations for Cates, Fish, Pike Spring, Upper Prior, and Lower Prior Lakes from 1997 to 2007. In the three Class I waterbodies (Spring, Upper, and Lower Prior) phosphorus concentration generally show a declining gradient from the furthest upstream (Spring Lake) to the furthest downstream (Lower Prior Lake). Spring Lake and Upper Prior Lake are considered nutrient enriched and hypereutrophic. Lower Prior Lake is moderately nutrient enriched and is considered mesotrophic to slightly eutrophic.

The reason for this spatial gradient is that urban and agricultural runoff TP concentrations tend to be relatively high. Because Spring Lake has the largest direct watershed of the three lakes, it experiences more direct impact of runoff pollution. In addition, lakes remove phosphorus and other pollutants through sedimentation and biological uptake. Therefore, much of the phosphorus and other pollutants in the water are removed in Spring Lake before this water flows to Upper Prior Lake and even more of the pollutants are removed by the time this water reaches Lower Prior Lake. For a detailed discussion of water quality in these lakes refer to the Prior Lake-Spring Lake Diagnostic Feasibility Study (Montgomery Watson, 1993).

Fish Lake has a moderate mean summer TP concentration. Mean summer TP in Fish Lake has ranged from 42 μg/l to 76 μg/l. The reason Fish Lake has a moderate TP concentration is probably due to the fact that it is located in the headwaters of the watershed and that it has a relatively small contributing watershed compared to its size.

7.5.1.2 Nitrogen

Nitrogen is also an essential nutrient for algae growth. Sometimes the availability of nitrogen can be limiting to algae growth, although this is not as common as phosphorus limitation. Figure 7-5 shows the mean summer total nitrogen (TN) concentrations for Cates, Fish, Pike Spring, Upper Prior, and Lower Prior Lakes from 1997 through 2007. As with TP there is a declining gradient of TN from Spring Lake to Lower Prior Lake. This TN patterns occurs for the same reasons given for the TP pattern.

Data has been collected on various forms of nitrogen including total Kjeldahl nitrogen (TKN) (organic nitrogen plus ammonia nitrogen), ammonia nitrogen, and nitrate plus nitrite nitrogen (NO_x-N). It is easiest for algae to assimilate ammonia, so ammonia is usually low when nitrogen is limiting. Ammonia concentrations in Spring, Upper Prior, and Lower Prior Lakes is generally moderate, but not typically low enough to limit algae growth.

7.5.1.3 Chlorophyll-a

Chlorophyll-*a* is a photosynthetic pigment common to all plants including algae. The concentration of chlorophyll-*a* is used as a convenient surrogate measure of algae abundance.

Figure 7-6 presents the mean summer chlorophyll-*a* concentrations for Cates, Fish, Spring, Pike, Upper Prior, and Lower Prior Lakes from 1997 through 2007. Chlorophyll-a concentrations over 30 μg/l are generally considered nuisance algae conditions and hypereutrophic.

7.5.1.4 Secchi Disk Transparency

Secchi disk transparency is a measure of water clarity. The Secchi depth is determined by lowering a white disk (or a black and white disk) to the point where the disk disappears from view. The depth of disappearance is then recorded as the Secchi depth. Because of its ease of measurement,

Secchi depth readings have been promoted through volunteer monitoring programs. Figure 7-7 shows the mean summer Secchi depth readings for Cates, Fish, Spring, Pike, Upper Prior, and Lower Prior Lakes from 1997 through 2007. Secchi depth readings less than 1.0 m are generally considered poor water clarity conditions and hypereutrophic.

The record of Secchi depth measurements for Upper and Lower Prior Lake is substantial. Secchi depth data have been collected on these lakes, every year from 1980 to the present. With this data set if even modest trends are present, they should be detectable, yet statistical analysis shows that there is no trend in water clarity for either Upper or Lower Prior Lakes.

7.5.2 Stream Water Quality Data

Stream water quality data collection for the District has also focused on eutrophication related parameters and has primarily been directed at evaluating contributions to the eutrophication of Upper Prior, Lower Prior, and Spring Lakes. These data include information on flow, phosphorus, and suspended solids. Two main stream studies have been completed by the District. In 1981, the Metropolitan Council initiated a detailed diagnostic/feasibility study of Spring Lake (Osgood 1983). This study included a runoff monitoring program that collected continuous flow gauge data with several water quality samples being collected throughout the year during run off events for two sites on County Ditch 13. The second study was a detailed diagnostic/feasibility study for Spring, Upper Prior, and Lower Prior Lakes, initiated by the District in October 1988. This study included a program of stream and storm sewer monitoring. The five stream sites for this program included County Ditch 13, two sites on the Buck Lake Channel, the Spring Lake outlet, the Crystal Lake Channel, and the Prior Lake outlet. Both of these studies were adversely affected for to droughts during the period of sampling.

The District anticipates engaging in greater monitoring of stream and ditch sites throughout the upper watershed over the next few years. This is endeavor is detailed in the District monitoring plan.

7.5.3 Impaired Waters and TMDLs

The District has several lakes that do not meet state and federal water quality requirements and have been included on the State of Minnesota List of Impaired Waters, also known as the 303(d) list after the relevant section of the federal Clean Water Act. Impairments are listed in Section 3 (Table 3.1) under the Lake Management Plans and TMDLs section.

As of 2013 the District has completed a TMDL study for excess nutrients for both Spring and Upper Prior Lakes. A stakeholder group of local and agency representatives have assisted the District in diagnosing the sources of excess nutrients to the lakes, establishing load reduction targets, and identifying Best Management Practices and activities to achieve load reduction and water quality goals. This TMDL was approved by the PCA and EPA in 2011. After the TMDL

study received final approval from all parties, the District will worked with the same stakeholder group to develop a TMDL Implementation Plan. This Water Resources Management Plan incorporates by reference the Spring Lake-Upper Prior Lake Nutrient TMDL and all amended versions.

The TMDL determined that an estimated 83 percent reduction in phosphorus load to Spring Lake would be required to improve the lake to the state water quality standard of 40 µg/L of Total Phosphorus. A significant share of the phosphorus load to Spring Lake is from internal sources such as sediment release, nuisance aquatic vegetation such as Curlyleaf pondweed, and a large population of bottom-feeding rough fish that exacerbate sediment release. Implementation activities identified in the TMDL for further consideration include not only reducing phosphorus inputs form the watershed but also managing the aquatic vegetation and fishery and considering some type of internal load management such as an alum treatment.

The TMDL determined that an estimated 52 percent reduction in phosphorus load to Upper Prior Lake would be required to improve the lake to the state water quality standard of 40 µg/L of Total Phosphorus. The most significant source of excess phosphorus to Upper Prior Lake is the water load received from Spring Lake. Improving the water quality in Spring Lake will reduce the phosphorus load to Upper Prior Lake. Upper Prior Lake also experiences some of the same internal phosphorus load sources as Spring Lake, and the TMDL identifies the same type of implementation activities as those described for Spring Lake.

7.6 GROUNDWATER RESOURCES

There are four principal aquifers underlying the Prior Lake-Spring Lake Watershed District. These aquifers include glacial drift (newest), Prairie du Chien-Jordan, Franconia-Ironton-Galesville, and Mt. Simon (oldest). The Bedrock Geology and Bedrock Susceptibility maps show the type of bedrock and the relative susceptibility of the bedrock aquifers to contamination. Other sources of information on groundwater resources within the region include:

- Scott County Groundwater Protection Plan (1996)
- Scott County Water Resources Plan (2008)
- Minnesota Geologic Survey
- United States Geologic Survey
- Minnesota Department of Natural Resources
- Minnesota Pollution Control Agency
- Minnesota Department of Health

SECTION 8 - LOCAL GOVERNMENT UNIT REQUIREMENTS

8.1 LOCAL PLANNING

After the District's Water Resources Management Plan has been approved and adopted, pursuant to M.S. 103B, local units of government having land use planning and regulatory responsibility are required to prepare a Local Water Management Plan or amend an existing Local Plan. Local plan content is driven primarily by M.R. 8410 and must include a capital improvement program and implementation plan to bring the local water management plan into conformance with the District's plan. Local Water Management Plans must be approved by the District and adopted by the LGU within two years of BWSR's approval of the District's Water Resources Management Plan. In accordance with M.S. 103B.235 Subd. 4, LGUs must adopt and implement Local Plans within 120 days of receiving District approval, and amend official controls to be in compliance with the Local Plan within 180 days of receiving District approval. LGUs shall complete necessary regulatory updates within one year of adoption of new Rules and Standards by the District.

8.1.1 Local Plan Content

The BWSR has adopted rules (M.R. 8410) regarding Local Plan content. Local Plans need to comply with M.R. 8410 and District requirements. In preparing a Local Plan update, unchanged information from the previous generation Local Plan may be adopted by reference. The District strongly encourages communities to develop the scope of their local plan with assistance of the District. At a minimum, Local Water Management Plans are required to:

1. Describe existing and proposed physical environment and land use.
2. Provide a narrative addressing stormwater infrastructure philosophy and which details who requires, constructs, and pays for it.
3. Define watershed areas and the volumes, rates, and paths of stormwater runoff.
4. Identify areas and elevations of stormwater storage adequate to meet performance standards established in the watershed plan.
5. Identify quality and quantity protection methods which meet standards.
6. Identify regulated areas and potential easements or land acquisition areas.
7. Outline procedure for submitting annual reports to agencies which document Wetland Conservation Act and monitoring program data consistent with state compatibility guidelines.
8. Set forth an implementation program, including a description of official controls, inspection and program maintenance, and a capital improvement plan.
9. Describe official controls and the responsible unit of government in the following areas: wetlands, erosion control, shoreland, floodplain, grading, and drainage.

In addition, the District requires that the following topics MUST BE included in Local Plan updates:

10. The Local Plan must discuss how the LGU will reduce nutrient loading to Impaired Waters in the District whether or not a TMDL is in preparation or has been approved by the MPCA/EPA, including specific operating programs and capital improvements contemplated during the life of the Plan.
11. The Local Plan must address how the LGU will reduce runoff volume to Spring Lake-Prior Lake, including specific operating programs and capital improvements contemplated during the life of the Plan.
12. The Local Plan must identify potential capital projects for which District cost-share will be sought, and projects the LGU may petition the District to complete.
13. The Local Plan must recognize and incorporate District wetland priority areas identified via completion of functions and values assessments and the District's planned CWPMP.

8.1.2 Watershed District Review

Each local unit of government shall submit a water management plan to the District for review before adoption by its governing body. The District will review and approve or suggest changes to the local water management plan in total or in part. The District shall take no more than 60 days to complete its initial review after written receipt of the plan. If the District fails to complete its review within 60 days (or within the time period identified in any extensions agreed to by the local unit of government), the local water management plan shall be deemed approved and the local unit of government shall carry on all duties as prescribed in its plan. Table 8-1 shows the current status of planning activities for the member communities.

The Board of Managers recognizes the communities in the District range from primarily agricultural townships to developing suburban cities. As such, the level of detail required in local plans will also vary. The Board will consider phased planning efforts for approval provided the District is notified of the phased effort prior to the onset of planning activity. For example, townships anticipating minimal development activity or creation of impervious surfaces within very localized areas can provide sufficient detail to allow for stormwater planning as needed. Having detailed computer modeling performed for areas which are not being developed is of limited benefit to the townships and District.

8.1.3 Financial Impact

This updated management plan should pose minimal changes to the financial burden of the member communities as the programs described herein generally follow the implementation activity levels of the past several years. While certain costs are expected to be incurred to be in compliance with local water planning, the District anticipates these to be low to reasonable.

Table 8.1. Status of Local Planning.

City or Township	Local Water Plan Received	Local Water Plan Approved	Equivalency MOA	Shoreland Ordinances	Floodplain Ordinances
Prior Lake	2006	Aug 2006	Mar 2007	Yes	Yes
Savage	2006	Apr 2007	Nov 2007	Yes	Yes
Shakopee	2007	Jun 2007	----	Yes	Yes
Scott County (including Sand Creek and Spring Lake Townships)	2006	Sept 2006	Jan 2008	Yes	Yes

The largest identifiable cost to the municipalities is likely to be the local water planning update mandated by the State of Minnesota and the District. Cost to prepare a suitable local plan will range between $10,000 and $30,000 depending upon the level of activity anticipated by the community. Given the large amount of stormwater planning already conducted by the cities, the actual costs of additional planning to bring the plan into compliance is anticipated to be less than $20,000. The District has taken measures to minimize the cost to communities by conducting District-wide stormwater flood studies, water quality monitoring programs, and allowing for phased planning efforts as described earlier. The standards and regulatory program undertaken by the District can be adopted by reference by the communities which wish to further lessen their financial burden. It is estimated that administrative and legal costs of approximately $5,000 will be incurred by the local communities for each ordinance that must be updated. The amount of ordinances that need to be updated varies by community.

8.1.4 Coordination

A principal problem in organizing and implementing effective plans for watershed management is the multiplicity of governmental agencies which have varying degrees of authority and responsibility with regard to drainage, flood and soil erosion control, water and land pollution, open space preservation and enhancement, land development and land use controls such as zoning and subdivision, and water resources conservation and development.

The problem confronting the District lies in harmonizing the requirements of state law, the administrative regulations of state agencies, the Metropolitan Council's development guidelines, and the planning objectives of individual county and municipal governments.

The District will strive for closer coordination and cooperation with all levels of government in the planning and administration of its policies and regulations. The District must abide by certain requirements and constraints in state law which provide for its establishment and operation. Furthermore, the District Managers must necessarily conform to regional, state, and federal policies and standards. Nevertheless, there is ample room for the District to be imaginative and innovative in the resolution of problems and the realization of opportunities specific to this watershed. For example, the District desires to serve as technical advisors to the municipalities in the preparation of local stormwater management plans and the review process for public and private projects prior to investment of significant public or private funds. To promote a

coordinated review process between the District and the municipalities, the District has undertaken several additional inventory programs to provide advance notice to landowners and local/county officials of preservation areas desired by the District.

The District Managers intend to maintain an effective liaison with other governmental units in order to ensure that the watershed's policy, plan, and program are well understood and to propose improvements and other needed changes in associated water resource management programs at state and regional levels. Coordination efforts will be pursued through continued use of public information/education, project reviews, and general regulatory program assistance.

8.2 REGULATORY CONTROLS AND ENFORCEMENT

The District intends to be active in the regulatory process to ensure that its water resources are managed in accordance with District goals and policies. Consistent with the Minnesota Watershed Act, the District will require permits for all developments and improvements taking place in the watershed. Municipalities have the option of assuming a more active role within the permitting process after adoption of local water management plans approved by the District and implementation of local ordinances consistent with the approved plan.

8.2.1 Rules and Standards

The District's permitting program is outlined in the permit information brochure, available at the District office or on the District website, and is based upon the District rules and standards, which are included in Appendix D. The Board of Managers updated its rules in 1996 with the assistance of member communities. The update included major revisions which reflected the philosophies of the Board of Managers. In addition to removing ambiguous text, the rules clarified regulatory roles of the cities, county, and District. They also addressed water quality issues in redeveloping areas and eliminated regulatory overlap by leaving wetland regulations to local governmental units who implement the Wetland Conservation Act. Another area of overlap that was eliminated was the cessation of District permitting for dredging and shoreline improvements. This area is adequately addressed by the Minnesota DNR, and in the case of larger projects, by the U.S. Army Corps of Engineers.

In 2001, the Board of Managers made significant additions to the rules by adopting general standards, a performance standard for infiltration, and buffer strip requirements for wetlands and watercourses. These additions reflected the District’s goals of enhancing water quality and volume control within the watershed. The Board worked closely with the cities, county and other interested parties on this revision, which was adopted in February 2001. The rules underwent minor revisions and were adopted again in August 2003.

The current rules and permitting handbook of the Prior Lake-Spring Lake Watershed District were adopted May 9, 2006. The rules and standards cover the topics of definitions, procedural requirements, general standards, stormwater management, erosion and sediment control,

floodplain alteration, wetland alteration, bridge and culvert crossing, drainage alterations, buffer strips, enforcement, variances, appeals, and permitting fees and security. The District will rely on these rules while entertaining regulatory enforcement and variance actions.

The District plans to update its rules as part of the strategic implementation portion of this plan. The District anticipates updates and revision in the areas of volume mitigation options, infiltration standards, buffer strip requirements, enforcement and noncompliance measures and a general rewrite to ensure clarity and understanding.

8.2.2 Equivalency Agreements

If municipalities wish to provide full regulatory control, the District will cede permit authority only following completion of an approved local plan, adoption of the ordinances, and implementation of inspection and administrative procedures necessary to ensure the full regulatory standards of the District are met. Equivalency of local water management plans and official controls will be determined according to the process in MN Statute 103B and the District's Water Resources Management Plan, as amended. To make a finding of equivalency, the Board must determine that:

- The local unit of government (LGU) having land use planning and regulatory responsibility has adopted a local water management plan and official controls that follow the policies and achieve the standards and objectives articulated in the District's Water Resources Management Plan, as amended, and the District's rules, as amended.
- The LGU has developed and is implementing a program to permit land disturbing activities in accordance with its official controls and to inspect, monitor and enforce compliance with the official controls.
- The LGU has developed and is implementing a program for operating and maintaining the best management practices required by its official controls and procedures, either directly or through developers' or homeowners' agreements
- The LGU incorporated public involvement and comment in the development of their local water management plan and official controls, including permit notice provisions that are equivalent to the District's requirements
- The LGU's Local Water Management Plan coordinates with other Comprehensive Land Use Planning and official controls for managing growth within the LGU

Once the Board of Managers finds that an LGU has adopted a Local Water Management Plan with official controls and procedures equivalent to the District's rules, the Board may, by resolution, cede all or part of the District's permitting authority to the LGU and suspend enforcement of specific District rule(s) within the LGU until such time as the Board may find that the LGU is no longer implementing official controls and procedures equivalent to the District's Rules. The Board resolution for transfer of permitting authority shall be accompanied by a Memorandum of Agreement (MOA) between the District and the LGU that includes the following:

- A description of the specific District rules that are the subject of the equivalency determination and the MOA.
- A list of any modifications to the Local Water Management Plan, official controls or procedures of the LGU that were required by the Board as a condition of the finding of equivalency and a time frame for completing the required modification(s).
- Provisions for notification of the District of permit applications, review and comment by the District, and District appeal of LGU permitting or enforcement decisions.
- Provisions for participation of District staff in any staff-level project review committee regularly convened by the LGU.
- Assurance that the LGU will not issue a variance for an activity that does not comply with the LGU's official controls or procedures that are applicable to the equivalency process until the District has approved the variance and any conditions it contains.
- Provision for District review and approval of LGU-sponsored projects, or county- or state-sponsored projects that are not regulated by the LGU but would be regulated by the District under its rules.
- An auditing procedure whereby the District can verify continued implementation by the LGU of official controls and procedures equivalent to the District's rules.
- General expectations of both the District and the LGU regarding the implementation of permitting, including enforcement of past permits, closeouts of open permits and provisions to dissolve the MOA and return permitting to the District if expectations are not being met and cannot be resolved.

Upon execution of the MOA and a resolution, the District shall no longer implement all or part of its permitting program within the LGU as specified in the MOA and resolution, until such time as the may Board find that the LGU is no longer in compliance with the MOA.

The District will periodically field inspect development projects and conduct annual operational audits of the local governmental unit's procedures and controls to ensure implementation in accordance with the plan. The District will exercise its right under M.S. 103B to resume regulatory authority and administration of programs if noncompliance with the approved water management plan is demonstrated. The current status of equivalency MOA with local municipalities can be seen above in Table 8-1. The District will also assess the adequacy of local governmental unit implementation of non-regulatory actions required by the District in local water plans (Items 10-13 of Section 8.1.1) during these annual operational audits and may consider these findings in consideration of cost-share funding approval.

SECTION 9 - PLAN REVIEW AND AMENDMENT

9.1 INTRODUCTION

This Water Resources Management Plan is intended to extend through the year 2019. The PLSLWD Board of Managers may initiate amendments to the plan at any time. Throughout the plan development process, it has been the intent of the Managers to provide a flexible framework for managing the dynamic watershed. As such, the Managers have outlined their vision for stormwater management based on current knowledge of the trends and forces shaping the watershed.

9.2 PLAN REVIEW

The Managers have realized that their vision for the watershed represents a departure from past practices in key areas while reinforcing on-going programs which are working. Not all elements of this vision have had the opportunity to achieve the level of stakeholder involvement or "buy-in" which would allow the new programs to be immediately implemented. It is the intent of the Board of Managers, as found in their meeting minutes and documented in their goals and policies, to be committed to an on-going process of public meetings to help revise the vision as necessary and implement the will of the watershed citizenry.

In developing the original M.S. 103B plan for the District, the Board of Managers utilized input from local elected officials, city staffs, and concerned citizens as part of two advisory committees: the Citizens 509 Task Force and Technical Advisory Committee (TAC). The Citizens 509 Task Force was comprised of local elected officials and interested citizens while the TAC included city staff members from each of the affected communities. The final plan was reviewed by the communities, counties, Metropolitan Council, Minnesota Pollution Control Agency (MPCA), Minnesota Department of Health (MDH), and the Minnesota Department of Natural Resources (DNR) prior to receiving the approval of the Board of Soil and Water Resources (BWSR).

The process of review for the development and approval of this document is similar to the past plan. As part of the planning process the District formed solicited participation in a Citizen Advisory Committee (CAC) which was made up of District residents, elected officials and representatives of local organizations. No formal CAC was created due to low participation. The District also solicited comments and input from the general public via a posting on the District website, a priority areas identification survey administered both online and in person, as well as two news briefs posted in the *Prior Lake American* newspaper. A Technical Advisory Committee (TAC) was also a part of the planning process. TAC members included representatives from LGUs and other government organizations.

Prior to submitting the plan for final approval to BWSR, the District requested comments on a preliminary draft from representatives of local organizations, the District's TAC, LGUs and other

government agencies as indicated by Minnesota Statue and as listed by BWSR as part of the Metro Plan Review.

Formal plan reviewers included representatives from the following:

- City of Prior Lake
- City of Savage
- City of Shakopee
- Sand Creek Township
- Spring Lake Township
- Scott County
- Scott County WMO
- Scott SWCD
- Shakopee Mdewakanton Sioux Community
- Lower Minnesota River WD
- MN Board of Soil and Water Resources
- Metropolitan Council
- MN Dept. of Agriculture
- MN Dept. of Health
- MN Dept. of Natural Resources
- MN Dept. of Transportation
- MN Pollution Control Agency

After the formal 60-day review of the plan, the District held a public hearing on November 17, 2009 for the review and public comment on the PLSLWD Water Resources Management Plan. The plan was then submitted for an additional 45-day review period and finally on to BWSR for final approval. BWSR formally approved the plan on June 23, 2010, indicating that the plan met all of the requirements of current Minnesota statutes and rules. The District Board adopted the plan on July 13, 2010 under resolution 10-230.

9.3 AMENDMENT PROCEDURES

All amendments to the Plan, except minor amendments, shall adhere to the full plan review and process set forth in M.S. 103B.231, as it now exists or as subsequently amended. The PLSLWD Board of Managers shall adopt the proposed plan amendments upon their approval by the Board of Water and Soil Resources in accordance with M.S. 103B.231, Subdivision 9, as amended.

Unless the entire document is reprinted, all amendments adopted by the Board of Managers must be printed in the form of replacement pages for the Plan, each page of which must include:

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

9.3.1 Minor Plan Amendments

The District may make minor amendments to this plan if either minor change is required or if problems arise that are not adequately addressed in the plan. Plan amendments may be proposed by any person to the Board provided they are submitted in writing along with a statement of the need and purpose of the amendment, along with a cost estimate for the amendment. Only the Board may formally initiate the amendment process. The District anticipates that minor amendments will be necessary in order to maintain Plan usefulness and accuracy.

A plan amendment will not be required in the following situations, unless expressly stated in Minnesota law or rules:

1. The updated cost of a project is not more than 20 percent greater nor 20 percent less than the cost shown in the capital improvement plan.
2. The Board deletes activities or projects from the strategic implementation plan or capital improvement plan or changes the year of implementation.

Amendments to the approved Implementation Plan may be considered to be minor plan amendments if the following conditions set forth in Minnesota Rules 8410.0140, Subp. 3 are met:

1. The original plan set forth the capital improvements but not to the degree needed to meet the definition of "capital improvement program" as provided in Minnesota Statutes, section 103B.205, subdivision 3; and
2. The affected county or counties have approved the capital improvement in its revised, more detailed form.

The following examples of other minor plan amendments are given in Minnesota Rules 8410.0020, Subp. 10:

> "...recodification of the plan, revision of a procedure meant to streamline administration of the plan, clarification of the intent of a policy, the inclusion of additional data not requiring interpretation, or any other action that will not adversely affect a local unit of government or diminish a water management organization's ability to achieve its plan's goals or implementation program."

In addition, minor plan amendments will be required in the following situations:

1. Adjustments or revisions to the Plan completed as a result of the District's biennial review, except those that fall under the exceptions noted above.
2. The Board elects to fund a project identified as unfunded in Section 4.
3. The Board initiates a capital improvement project listed on the current Implementation Plan using a method of financing other than ad valorem levy, local cost share, grants or bonding.
4. Implementation of a project that is discussed in the plan, but not expressly listed in the strategic implementation plan.
5. Addition of new goals or actions that will require revision of the District's rules or directly affect the programs or budgets of LGUs within the District, if sufficient justification is currently in the Plan.

The amendment procedure for minor plan amendments, as defined in Minnesota Rules 8410.0020, Sub. 10, and 8410.0140, Sub. 3 shall be in accordance with M.R. 8410.0140, Sub. 2 (A, B, and C), as such rules now exist or as subsequently amended, including:

- Submission of the amendment for review to PLSLWD citizen advisors, municipalities, Scott County, Scott County WMO, Scott SWCD, appropriate state review agencies, the Metropolitan Council and BWSR.
- The District must respond in writing to any concerns raised by reviewers.
- The District must hold a public hearing on the proposed amendment.
- Submission of the revised amendment to reviewers.
- Submission of final revised amendment to BWSR for approval.

9.3.2 Future Amendments

Several mandatory amendments are anticipated for metropolitan area watersheds in addition to the amendments that will occur as a result of management plan implementation. A brief amendment description is provided below to advise LGUs of these requirements and to stimulate stakeholder dialogue prior to their anticipated inclusion in this or future Plan revisions. This list is not a comprehensive summary of mandated revisions or amendments that might be contemplated or required.

Table 9.1. Actions potentially requiring future amendments to this Plan.

Approximate Year	Initiating Agency	Description
As necessary	PLSLWD	Revisions to the management plan or capital improvement program.
As necessary	PLSLWD, various agencies, regulatory revisions	Various amendments based, for example, on new legislative requirements or policy initiatives, or technological advances.
As necessary	EPA/MPCA	Changing requirements for NPDES permitting for stormwater discharges may require revisions to this Plan.
2010-2011	PLSLWD, EPA/MPCA	While the Plan incorporates by reference the future draft TMDL implementation plans for the Spring Lake-Upper Prior Lake nutrient TMDL and other TMDLs, completion and approval of TMDLs and TMDL Implementation Plans may result in the need to amend this Plan.
2010 and subsequent	PLSLWD, EPA/MPCA	The watershed includes waters currently listed as impaired for which TMDLs have not yet been initiated. Completion of those studies and development of implementation plans may require revisions to policies, strategies, metrics, capital projects, management and management programs for those waters.
2010 and subsequent	Metropolitan Council/ BWSR/MPCA	Ongoing metropolitan area planning to develop target pollution loads for watersheds in the metropolitan area may require the District to amend this plan to meet specified performance standards.
2010 and subsequent	EPA/MPCA	New impairments may be identified in the waters of the watershed, resulting in 303(d) listing as Impaired Waters and the initiation of TMDLs and implementation plans requiring improvement.

9.3.3 Plan Updates

This plan will guide the District and its activities through 2019 or until superseded by adoption and approval of a subsequent plan or amended plan. Prior to the plan expiration, the District will begin the process of updating its plan in accordance with all applicable Minnesota laws and rules.