

1.0 Executive Summary

The Valley Branch Watershed District (VBWD) Watershed Management Plan (Plan) sets the vision, guidelines, and proposed tasks for managing surface water within the boundaries of the VBWD. This Executive Summary summarizes the highlights of the VBWD Plan, including introductory information, the VBWD vision and mission, goals, policies and implementation tasks.

1.1 Introductory Information

VBWD was established on November 14, 1968 in response to a citizens' petition to the State of Minnesota to address water resource issues in the watershed.

Like all watershed districts, the VBWD is a special purpose unit of local government that manages water resources on a watershed basis (a watershed is an area of land that drains to a given lake, river, stream or wetland). Watershed district boundaries generally follow natural watershed divides, rather than political boundaries.

VBWD is located on the eastern edge of the Minneapolis-St. Paul Metropolitan area and covers approximately 70 square miles. Approximately one square mile is in Ramsey County, the remainder of the VBWD lies in Washington County. Figure 2-1 shows the location of the VBWD and the communities that lie or partially lie within the VBWD. The following is a list of these communities:

Ramsey County Communities	Washington County Communities		
Maplewood	City of Afton	City of Mahtomedi	City of St. Mary's Point
North St. Paul	Baytown Township	City of Oak Park Heights	West Lakeland Township
White Bear Lake	City of Grant	City of Oakdale	City of Woodbury
	City of Lake Elmo	City of Pine Springs	

Watershed districts are governed by a local board of managers who are appointed by the boards of the counties with land in the watershed district. In the VBWD, the board of managers has five members; four managers are appointed by the Washington County Board and one manager is appointed by the Ramsey County Board. The appointments are for staggered three-year terms.

The regularly scheduled meetings of the VBWD board of managers are held twice a month, on the second and fourth Thursdays. The meetings are open to the public and are held at the Lake Elmo City Council Chambers, located at 3800 Laverne Avenue North.

VBWD has no central office and no full-time staff. All services, including engineering, legal, accounting, inspection, and secretarial services are provided by consultants. The VBWD has a website (www.vbwd.org), which includes VBWD permitting information, manager and consultant

information, agendas and minutes from managers' meetings, annual reports, lake level and water quality data, and other information.

Watershed districts within the Twin Cities metropolitan area come under the guidance of both the Watershed Act (Minnesota Statutes 103D) and the Metropolitan Surface Water Management Act (Minnesota Statutes 103B). Minnesota Statutes 103B and 103D require watershed districts to prepare watershed management plans. In addition to the plan requirements given in statute, watershed districts in the Twin Cities metropolitan area must also follow the detailed plan requirements of Minnesota Rules 8410. This watershed management plan (Plan) is the fourth VBWD Plan approved by the Minnesota Board of Water and Soil Resources (BWSR) or its predecessor.

1.2 Watershed District Purposes

1.2.1 General Watershed District Purposes

The general purposes of a watershed district are to conserve natural resources through land use planning, flood control, and other conservation projects to protect the public health and welfare and for the wise use of the natural resources (Minnesota Statutes 103D.201).

Watershed districts can be involved with a number of issues, including 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.

In addition, the purposes of watershed management organization water management programs in the metropolitan area (quoted from Minnesota Statutes 103B.201) are as follows:

1. Protect, preserve, and use natural surface and groundwater storage and retention systems.
2. Minimize public capital expenditures needed to correct flooding and water quality problems.
3. Identify and plan for means to effectively protect and improve surface and groundwater quality.
4. Establish more uniform local policies and official controls for surface and groundwater management.
5. Prevent erosion of soil into surface water systems.
6. Promote groundwater recharge.
7. Protect and enhance fish and wildlife habitat and water recreational facilities.
8. Secure the other benefits associated with the proper management of surface and groundwater.

1.2.2 Historical VBWD Purposes

For the first 15 to 20 years, the VBWD board of managers focused primarily on how to solve the flooding problems in the watershed. This major effort culminated in the construction of the VBWD's Project 1007, a \$4.25 million project (completed in 1987) to relieve flooding problems on many of the lakes within VBWD. Project 1007 links the major lakes in the northwest and central portions of VBWD to an outlet pipe along Interstate Highway 94, eventually discharging to the St. Croix River.

The VBWD rules and regulations have been an essential tool in preventing problems. In 1972, VBWD adopted rules and regulations and began reviewing proposed developments and other projects in the watershed. In 1975, VBWD began its formal permit program. The VBWD rules and regulations have always addressed the water quantity impacts of stormwater (e.g., flooding, rate control). At first, the VBWD rules indirectly addressed the water quality impacts of stormwater, but since 1995 have directly addressed the impacts (upon implementation of the 1995 VBWD Plan).

The VBWD has been concerned about water quality since its formation. Since 1971, VBWD and other authorities have been monitoring the water quality of lakes in the watershed. Streams have been monitored since 1972.

Since 1995, VBWD has concentrated on solving remaining flooding problems and conducting water quality studies. Between 1997 and 2001, the VBWD completed nine water quality studies for 24 water bodies within VBWD.

In addition to Project 1007, the Valley Branch Watershed District has implemented several programs and projects over the years to improve the quality of life in the watershed. Some of the more significant programs and projects include:

- Completing, operating, and maintaining a flood relief project for the Olson Lake Estates neighborhood,
- Completing a flood duration reduction project for the Downs Lake neighborhood,
- Collecting monthly water levels on more than a dozen lakes,
- Collecting groundwater levels from nearly two dozen VBWD groundwater observation wells,
- Collecting water quality data, using volunteers and cooperating with other organizations, and developing baseline data for almost every surface water within the VBWD,
- Completing water quality studies to determine if a water body's quality is achieving its goal and developing water management plans to improve or protect a water body's quality,
- Cooperating with other agencies and organizations in studies and capital projects to address water quality and flooding issues of mutual interest (e.g., Fahlstrom Pond flood study, study regarding impact of Woodbury wells on Valley Creek, shoreline restoration project on Silver Lake, and the Neighborhood Wilds project in Afton),
- Reviewing and/or permitting about 30 development proposals per year

1.2.3 VBWD Purposes: 2003 Vision and Mission

In 2003, the VBWD Managers adopted a vision and mission statement to guide them through the planning process for this VBWD Plan.

VBWD Vision:

Always be careful stewards of the water resources within our watershed boundaries.

VBWD Mission:

To manage and protect our water resources: lakes, ponds, creeks, streams, wetlands, drainages, and groundwater by:

- A. Promoting open communication with our constituents, both our citizen base and pertinent governmental units.*
- B. Improving and protecting the quality of water for all water bodies within the VBWD.*
- C. Managing the quantity of water and minimizing the negative impact on the VBWD from floods, high flows, and droughts by providing public works projects and other prudent measures.*
- D. Understanding the effects of community growth and other activities on groundwater, initially focusing on the groundwater-surface water interface.*
- E. Continuing to enforce the Wetland Conservation Act requirements as the responsible local unit of government.*
- F. Educating our constituents and the local units of government within the VBWD on water quality and quantity issues, management, and means of improvement.*

1.3 VBWD Plan Organization and Summary of VBWD Plan Highlights and Initiatives

The VBWD Plan sets the course for the VBWD management of the water resources within the watershed. The VBWD Plan provides data and other background information, outlines the applicable regulations, assesses specific and watershed-wide issues, sets goals and policies for the VBWD and its resources, and lists implementation tasks to achieve the goals. The VBWD Plan also discusses the financial considerations of implementing the VBWD Plan and other funding sources that may be available to the VBWD. The VBWD Plan is organized into eight major sections, summarized as follows:

Section 1.0 Executive Summary

Section 1 summarizes the highlights of the VBWD Plan, including introductory information, the VBWD vision and mission, goals, policies and implementation tasks.

Section 2.0 Introduction: VBWD Purposes, Vision & Mission, Location, and History

Section 2 provides background information about watershed districts, VBWD, and the board of managers, includes the VBWD vision and mission, and provides a brief history of VBWD.

Section 3.0 Watershed Description, Land and Water Resource Data and Inventory

Section 3 provides technical information describing the surface and subsurface conditions of the watershed, including precipitation, land cover, soils, topography, geology, groundwater, surface water resources, unique features and scenic areas, and pollutant sources. This section also includes a number of maps and summary tables, such as a map of major and minor subwatersheds and a table of drainage areas.

Section 4.0 Overall Issues, Goals, and Policies

Section 4 presents the issues, goals, and policies that pertain generally to VBWD. Section 4 contains one introductory section (Section 4.0), and ten subsections. Nine of the subsections are organized around major topics, as follows:

4.1 Public Involvement and Public Information	4.6 Groundwater Management
4.2 Surface Water Quality	4.7 Wetland Management
4.3 Stream Management and Restoration	4.8 Erosion Prevention and Sediment Control
4.4 Stormwater Runoff Management	4.9 Funding
4.5 Water Level and Floodplain Management	

Each of these nine subsections is organized in the same manner, starting with a summary table that describes: (1) the importance of the topic area, (2) general issues related to the topic area, (3) relation of the VBWD mission to the topic area, and (4) the policies VBWD will implement to accomplish its mission.

Following the summary table, the remainder of each subsection covers the following topics (in the following order): (1) history, (2) identified issues, and (3) policies, strategies, and actions to be implemented to address the identified issues.

A tenth subsection (Section 4.10 References) lists the documents and other references used for all of Section 4.

Section 5 of the VBWD Plan presents detailed issues pertaining to specific water bodies and how VBWD will address these issues. All of the actions identified in each of Sections 4.1 through 4.9, and Sections 5.1 through 5.38, are included in the table of implementation tasks (Table 7-1).

The major issues, policies, and proposed actions in each of the nine subsections (Sections 4.1 – 4.9) are summarized in the following paragraphs.

Section 4.1 Public Involvement and Public Information

The VBWD recognizes the increasing importance of expanding the involvement of the public, local units of government, and other agencies, and expanding public information efforts to meet the challenges of managing VBWD's water resources. Through these efforts, the VBWD will increase the public's understanding of water resource management and issues in the watershed, and foster long-term public (and agency) commitment to protecting these resources.

The VBWD has used various methods to involve and inform the public, such as its website (www.vbwd.org) and citizen monitoring efforts. The VBWD will continue and expand these efforts to increase awareness of the VBWD, coordinate and cooperate with other groups to educate the public, recruit (and recognize) volunteers for monitoring efforts and involvement in VBWD programs, promote positive behaviors that have a positive impact on water resources, and to use its advisory committees in meaningful ways.

To assist with all of these watershed education-related efforts, the VBWD will hire a watershed educator.

Section 4.2 Surface Water Quality

Although surface water quality is commonly defined by its physical, chemical, biological, and aesthetic characteristics, good water quality is more than these few measurements. Water quality that is part of a healthy environment supports a rich and varied community of organisms and protects public health.

The lakes, ponds, streams, and wetlands in VBWD are important community assets that provide many benefits. The high quality of the watershed's natural resources makes it an attractive place for people to live. The VBWD recognizes that preserving the high quality of the watershed's natural resources is critical to the existence of a high quality of life among the citizens residing in the watershed and in the larger metropolitan region.

The VBWD Plan includes policies for a revised water body classification system, based on water quality, public access to the water body, whether or not the water body drains directly to an "outstanding resource value water" or a trout stream, and whether or not the water body is a stormwater pond. The VBWD will use the classification system to assist the VBWD in prioritizing and funding water quality improvement projects.

The VBWD Plan includes a “non-degradation” of water quality policy for all major water bodies. This results in a change to the VBWD water quality treatment requirements (described in Section 4.4).

The VBWD will continue to monitor the VBWD major water bodies. The VBWD Plan includes guidelines for the water quality monitoring program, which includes a new habitat monitoring program. The VBWD will analyze water quality data and calculate water quality trends. The VBWD set water quality “action triggers,” which, in combination with water quality data and trends, will assist the Managers in determining appropriate water quality management actions.

The VBWD Plan calls for the active participation of VBWD in the process of preparing Total Maximum Daily Load (TMDL) studies and calls for VBWD to be the lead agency for implementing TMDL studies within VBWD.

Through its permitting process, the VBWD will continue to require a 16.5-foot vegetated buffer from the wetland edge (or Minnesota Department of Natural Resources (DNR) Ordinary High Water elevation), and will encourage and support the establishment of wider buffers. The VBWD will encourage and support the establishment and maintenance of vegetated buffers between established/existing yards/parks and the shore of water bodies.

Water quality improvement actions proposed in the VBWD Plan are summarized in Section 4.2, and discussed in more detail in Section 5. These actions include aquatic plant management efforts (especially curlyleaf pondweed), in-lake alum treatment, structural water quality improvement projects in the watershed (e.g., detention basins), stream habitat improvement and stabilization projects, and possible future projects resulting from the habitat monitoring program, TMDL studies, and future diagnostic feasibility studies.

This section also includes three appendices. Appendix A-4.2 provides water quality background information, including water chemistry and biological data (such as aquatic plants). Appendix B-4.2 describes VBWD’s proposed habitat monitoring program methods. Appendix C-4.2 provides the details regarding the VBWD water body classifications.

Section 4.3 Stream Management & Restoration

The streams in VBWD are important community assets that provide many benefits. Streams are one of the watershed’s natural resources that make VBWD an attractive place for people to live. The VBWD recognizes the importance of preserving the high quality of the watershed’s streams since they are critical to the area’s high quality of life.

The Minnesota Department of Natural Resources has designated the perennial reaches of Valley Creek as a trout stream. Valley Creek is one of 13 trout streams in the Twin Cities metropolitan area, and the creek sustains a naturally reproducing trout population.

Streams are also affected by water quantity issues, such as flooding, low water levels, high flows, and low flows. Addressing flooding issues continues to be the highest priority because flooding has

the highest potential for causing damages and property loss. The VBWD Managers will also seek to manage the stormwater and water resources in the watershed to maintain adequate streamflow, although they cannot control the main cause of deleterious low flows (drought).

The VBWD's past stream management actions have included floodplain management, stream monitoring (physical condition, water quality, quantity of flow, and biological), water quality data analysis, and streambank and gully erosion assessments.

The VBWD Plan groups streams as either perennial (i.e., Valley Creek and Kelle's Coulee) or intermittent (e.g., Raleigh Creek). The VBWD used the grouping system to determine frequency and type of monitoring, and will use the grouping to assist the managers in prioritizing and funding stream management and restoration projects.

The VBWD Plan calls for the regular monitoring of the water quality (including biological indicators) and streamflow of Valley Creek and Kelle's Coulee, and the physical conditions of Valley Creek, Kelle's Coulee and Raleigh Creek.

This section of the VBWD Plan presents flood protection/water level control issues, policies, and actions that pertain to streams. Broader information on this topic is presented in Section 4.5. Flood protection/water level control issues and actions pertaining to specific water bodies are presented in the individual subsections of Section 5.

The VBWD Plan includes a policy for implementing projects to address identified streambank erosion, gully erosion, and other stream degradation problems. Proposed projects regarding these types of issues are discussed in more detail in Section 5 and include:

- Raleigh Creek stream management and stream restoration project
- Valley Creek dam inspection, analysis, and rehabilitation or dam removal project
- Valley Creek stabilization projects
- Silver Lake ditch erosion stabilization project
- Gully stabilization projects:
 - Ravine from Weber Pond to Long Lake
 - Goose Lake
 - Goetschel Pond

Erosion issues, policies, and actions are also discussed in Section 4.8 and the individual subsections of Section 5 of the VBWD Plan.

Section 4.4 Stormwater Management

Stormwater runoff greatly influences the quality and quantity of surface water, which means it must be managed to accomplish the VBWD's goals for maintaining and improving water quality and managing water quantity.

The VBWD has been managing stormwater runoff by carrying out its permit program, which includes preventive measures. These measures address the negative affects of stormwater runoff at the time of development, rather than afterwards. The VBWD will continue its permitting program.

The VBWD Plan contains new policies that will affect the permit program. The most significant new policy calls for the VBWD to develop and adopt stormwater volume control requirements, which will then be incorporated into the VBWD's rules and regulations (and permitting program). Another new policy revises the water quality treatment requirement for proposed projects to provide a water quality treatment volume equivalent to the 1995 VBWD Plan "Level I" standards. This requirement will apply throughout the watershed.

Related to its permit program, the VBWD Plan includes a policy encouraging developers to implement innovative stormwater management techniques through VBWD's development and implementation of an incentive program, and construction of demonstration projects.

The VBWD will continue to manage runoff so that future peak rates of runoff crossing community boundaries and/or leaving development sites are less than or equal to existing/pre-development rates of runoff.

The VBWD recognizes that a significant number of stormwater treatment ponds have not been adequately maintained. To address this issue, the VBWD will first inventory stormwater treatment ponds and develop a plan that identifies (and prioritizes) needed maintenance, repairs, and/or retrofitting of the ponds. The VBWD will work with the local units of government to assign responsibilities and develop the plan. The VBWD will then implement the parts of the plan that are assigned to the VBWD.

This section of the VBWD Plan also describes other permit requirements and provides permit submittal information. Section 4.4 includes two appendices. Appendix A-4.4 contains VBWD's Storm Water Pollution Prevention Plan and Appendix B-4.4 contains the VBWD rules and regulations.

Section 4.5 Water Level and Floodplain Management

Flood protection was the first responsibility of the VBWD. This responsibility has expanded to cover all issues related to water quantity – flooding, low water levels, high flows, and low flows.

Addressing flooding issues continues to be the highest priority because flooding has the highest potential for causing damages and property loss. The VBWD needs to address existing flooding problems and prevent future flooding problems from occurring.

Maintaining adequate flows/water levels in the watershed's water resources is important for human enjoyment of the water resources, and maintaining wildlife habitat and fishery resources. The VBWD will seek to manage the stormwater and water resources in the watershed to maintain adequate quantities of water in the water resources, although they cannot control the main cause of deleterious low flows and low water levels (drought).

This section provides a detailed history of the VBWD's past water level and floodplain management activities. Highlights include construction of the Project 1007 outlet system, construction of the Olson Lake Estates Pond outlet, modifications to the Lake Elmo outlet, construction of the Downs Lake outlet, completion of a number of studies exploring flood relief options for the Sunnybrook Lake area, determination of flood levels in various locations, studies of Fahlstrom Pond flooding, and water level monitoring.

The VBWD Plan includes policies to address water level and floodplain management issues, including continuation of data collection efforts (lake level monitoring, precipitation data, groundwater level observation, and snowpack monitoring), assisting property owners in FEMA "unnumbered A zones," operating, inspecting, maintaining, and repairing VBWD flood control systems, continuation of flood level determination requirements as part of the permit review (with special requirements for landlocked water bodies), and continuation of limits to filling within the floodplain.

The VBWD will take appropriate actions to solve flooding problems in VBWD. The proposed projects in the VBWD Plan regarding these types of issues are discussed in more detail in Section 5 and include:

- Sunnybrook Lake flood level reduction project (or other listed options)
- Echo Lake Addition flood relief (to be performed by City of Mahtomedi)
- Long Lake outlet debris removal
- Rest Area Pond outlet restriction (if approved)

Section 4.6 Groundwater Management

Most VBWD residents obtain their drinking water from groundwater. This makes it especially important to ensure that these aquifers are uncontaminated, protected from future contamination and provide adequate supplies. Groundwater quality and quantity is closely linked to the aboveground environment, since they are dependent on the infiltration of surface water/rainfall through the soil. Several VBWD water bodies also are groundwater-dependent and need an adequate supply of clean groundwater. The VBWD recognizes that maintaining clean, safe groundwater supplies is critical to human and environmental health and to the economic and social vitality of our communities.

The VBWD Plan discusses three locations in the VBWD where groundwater contaminants have been found: (1) Lakeland/Lakeland Shores Special Well Construction Area, (2) Baytown Township

Groundwater Contamination Site/Special Well Construction Area, and (3) Washington County Landfill Special Well Construction Area. In these areas, there are added costs to manage the affected water supply.

The VBWD's past groundwater management activities have included monitoring groundwater levels, working with the MPCA in its efforts to discharge treated contaminated water from a landfill, contributing to Washington County groundwater and groundwater-surface water studies in the northern and southern parts of the county and in the Woodbury/Afton area, and reviewing/commenting on all DNR appropriation permits.

The VBWD will continue to collect groundwater level readings. Upon completion of the county's groundwater studies, the VBWD will use this data and the VBWD data to categorize surface waters with respect to their interaction with groundwater.

Upon completion of the county's groundwater studies, the VBWD will develop rules and regulations to protect the quality and quantity of groundwater. These rules could involve infiltration requirements, and/or a groundwater appropriations permitting program.

The VBWD Plan includes a policy calling for the submittal of wellhead protection plans to VBWD for review.

A proposed groundwater management project in the VBWD Plan is the abandonment of the old Lake Olson well. This issue and project is discussed in more detail in Section 5 of the VBWD Plan.

This section also includes one appendix: Appendix A-4.6 provides the MPCA's fact sheet regarding groundwater sampling near the Washington County Landfill.

Section 4.7 Wetland Management

Wetlands are an abundant resource within the VBWD that provide value to the community and perform a variety of physical, chemical, and ecological functions. A healthy watershed is one in which wetlands are an integral part of the ecosystem. The VBWD recognizes that wetland quality is closely linked to the surrounding environment and land use.

Preservation of wetlands is controlled by various local, state, and federal laws. Effective wetland management depends on an accurate inventory and classification of wetland resources, especially in areas expected to develop soon, and administration of a wetland management program, developed with input from community residents and agencies.

Past VBWD wetland management activities include adoption of revised rules and regulations regarding wetland protection (prior to the Wetland Conservation Act), and administration of the Wetland Conservation Act as the local government unit (LGU). The VBWD will continue as the LGU, as long as the communities continue to designate the VBWD as the LGU.

The VBWD Plan includes a phased, targeted approach to wetland management, comprised of two major actions:

1. Revision of the VBWD rules and regulations regarding wetland management, to incorporate wetland management standards, and a wetland management classification system.
2. Completion of wetland inventories and assessments in targeted areas (e.g., areas expected to develop soon). The VBWD will meet with agencies, local government units, technical evaluation panel members, and other groups to share the results of the inventories, assessments, and classifications, gather feedback, and explore partnerships and potential projects related to wetland management.

The VBWD Plan also includes a policy for developing an invasive species control program. In addition to education efforts, the VBWD Plan proposes projects related to invasive species control. These issues and projects are discussed in more detail in Section 5 and include:

- Eagle Point Lake wetlands – work with Washington County Parks to eradicate reed canary grass
- Eagle Point Lake Dam – work with Washington County Parks to revegetate

Section 4.8 Erosion Prevention and Sediment Control

Erosion prevention and sediment control is a major responsibility of the VBWD. Erosion and sedimentation have a high potential to cause damages, property loss, and adverse impacts on water quality. As the watershed continues to urbanize, there will be increased potential for erosion and sedimentation problems to occur. Although erosion and sedimentation are natural processes, they are often accelerated because of human activities.

The VBWD's past involvement in erosion prevention and sediment control has primarily been through implementation of its rules and regulations/permit program. The VBWD has also identified, inventoried, and monitored erosion and sedimentation problems in the watershed, including Valley Creek, Raleigh Creek, Long Lake, and other areas.

The VBWD Plan includes policies for erosion prevention and sediment control, including identification, inventorying, monitoring, and implementation of measures to correct erosion and sedimentation problems, continued administration and enforcement of the VBWD permit program, and assisting local units of government in developing, adopting, administering, implementing, and enforcing erosion prevention and sediment control ordinances.

The VBWD Plan includes the following proposed projects related to erosion prevention and sediment control. These issues and projects are discussed in more detail in Section 5 and include:

- Long Lake – eliminate source of sedimentation
- Correct (future) identified erosion and sedimentation problems
- Other ditch stabilization and stream restoration projects are discussed in Section 4.3

Section 4.9 Funding

Funding is essential for the VBWD to implement its mission and policies. Minnesota Statutes give all watershed districts, including the VBWD, various methods of obtaining funds to implement their watershed management plans and to finance their basic operations. For particular projects, it can be a challenge to develop funding methods that the public views as fair.

In the past, the VBWD has funded projects using special assessments and ad valorem tax levies over the entire VBWD and/or subwatersheds of the VBWD.

The VBWD will continue to fund its basic operations through ad valorem tax levies. For studies and capital projects less than \$500,000, the VBWD intends to fund these projects using ad valorem tax levy over the entire watershed. Maintenance activities will likely be funded using an ad valorem tax over the entire VBWD and/or a water management district (utility).

For VBWD capital projects over \$500,000, the VBWD will likely use a combination of methods: ad valorem taxes (levied over the entire watershed or on a subwatershed basis), water management tax district (utility), and/or special assessments. Tables in the VBWD Plan provide guidelines for assisting the VBWD in determining the funding methods for VBWD water quality projects over \$500,000 (Table 4.9-2) and for other VBWD projects over \$500,000 (Table 4.9-3).

The VBWD will continue to charge permit application fees and collect cash sureties to defray the costs of its permit program.

The estimated tax impact of various levy amounts on residential properties is given in this section.

This section also contains one appendix: Appendix A-4.9 provides information about grant and loan programs.

Section 5.0 Individual Watershed Management Plans

Section 5 presents information on the following 36 specific water bodies and watersheds within the VBWD in Sections 5.1 through 5.36:

5.1 Silver Lake	5.13 Lake Elmo	5.25 Sunfish Lake
5.2 Acorn (Mud) Lake	5.14 Downs Lake	5.26 Friedrich's Pond
5.3 Echo Lake	5.15 Horseshoe Lake	5.27 Legion Pond
5.4 Weber Pond	5.16 West Lakeland Storage Site	5.28 Bay Lake
5.5 Long Lake	5.17 Rest Area Pond	5.29 Goose Lake
5.6 Capaul's Pond	5.18 Fahlstrom Pond	5.30 Clear Lake
5.7 Lake DeMontreville	5.19 Lake Edith	5.31 Goetschel Pond
5.8 Lake Olson	5.20 Valley Creek	5.32 Mergens Pond
5.9 Lake Jane	5.21 Sunnybrook Lake	5.33 Rose Lake
5.10 Beutel Pond	5.22 Klawitter Pond	5.34 Kramer Pond
5.11 Raleigh Creek	5.23 Cloverdale Lake	5.35 Barton Pit
5.12 Eagle Point Lake	5.24 McDonald Lake	5.36 St. Croix River
		5.37 Kelle's Coulee
		5.38 Swede Hill Creek

The VBWD chose these 38 watersheds for inclusion in Section 5 of the VBWD Plan based on VBWD's knowledge of the following:

- Water quality issues and data
- Past or possible future flooding problems
- Intercommunity drainage problems
- Revisions to previously-published flood elevations
- Existing or possible future impacts to VBWD's Project 1007 drainage system
- Outstanding water resources

Each of the 38 individual watershed management plans includes the following:

- General information
- Water quality management plan, with supporting information summarizing:
 - Water chemistry data, and
 - Biological data, including information on fisheries, macrophytes (large aquatic plants), phytoplankton (non-rooted, floating plants – algae), and zooplankton (microscopic aquatic animals)
- Water quantity management plan, which typically includes supporting information on drainage patterns, flood levels, and flooding issues
- Other noteworthy information (e.g., groundwater pollution sites, groundwater-surface water interactions, etc.)

Section 5 is only available in CD format or on the VBWD website, due to its very large size. A CD containing Section 5 is included in a pocket in paper copies of the VBWD Plan. Although this Executive Summary does not summarize each of the 38 individual watershed plans, all of the implementation tasks are included in Table 7-1.

Section 6.0 VBWD Plan Review, Update and Revision

Section 6 provides information regarding the VBWD Plan review and approval process, updating the VBWD Plan, and the revision/amendment process for the VBWD Plan. The section includes clear guidelines for when general (major), minor, or no plan amendments are required, based on the type of VBWD Plan revision.

Section 7.0 Implementation Program

Section 7 presents the implementation program. Table 7-1 incorporates all of the implementation activities (studies, monitoring, rules, projects, etc.) called for in other sections of the VBWD Plan (especially Sections 4 and 5) into one table. The activities in Table 7-1 are grouped as follows:

1. Annual administrative activities
2. Annual operations and maintenance
3. Annual data collection and reporting activities
4. Non-annual administrative activities
5. Non-annual data collection and reporting activities
6. Non-annual studies
7. Capital projects

Table 7-1 includes a description of the activity, a VBWD Plan reference, VBWD's involvement in the activity, the estimated costs of the implementation activities, the potential funding source(s), and the proposed year of implementation.

Table 7-2 reorganizes all of the projects in Table 7-1 to show the year-by-year estimated costs of the implementation program and the total annual costs from 2005-2015.

This section also discusses the impact of the VBWD's implementation program on local governments.

Section 8.0 Local Watershed Management Plans

Section 8 discusses the VBWD and Minnesota requirements for local watershed management plans, the status of local planning, and the VBWD review process for local watershed management plans.

This section also discusses the steps necessary for a community to assume the permitting authority for all land alteration activities.

1.4 2011 VBWD Plan Amendment

In 2011 this Plan was amended to document the inclusion of two new subwatersheds that were formerly part of the Lower St. Croix Watershed Management Organization (LSCWMO): Kelle's Coulee and Swede Hill Creek. The Kelle's Coulee watershed is a 3.7 square mile watershed located along the former southern boundary of the VBWD. The Swede Hill Creek watershed is approximately 1.3 square miles in size and located adjacent to the Kelle's Coulee watershed and St. Croix River. The 5 square miles added by the additional watersheds increases the total VBWD area to 70 square miles.

This Plan has been amended to include critical changes resulting from the inclusion of these watersheds. The most significant revisions include the following:

- Revised jurisdictional boundary in Figures 2-1 and 3-1
- Revised watershed boundaries in Figure 3-2
- Updates to Section 4 – Overall Issues, Goals and Policies, including:
 - Section 4.3 – Stream Management and Restoration
 - Section 4.4 – Stormwater Management
 - Section 4.6 – Groundwater Management
- Additional individual watershed management plans, including
 - Kelle's Coulee (Section 5.37)
 - Swede Hill Creek (Section 5.38)
- Revised Implementation Tables (Tables 7-1 and 7-2)

Minor changes have been made throughout the Plan to reflect the new watershed areas. To limit the extent of plan revision, much of the water resource inventory information (and associated maps) for the Kelle's Coulee watershed and Swede Hill Creek watershed are not included in Section 3 of this Plan. Instead, the reader is directed to the most recent *LSCWMO Watershed Management Plan* (EOR, 2009) and/or the *Kelle's Coulee Stream Management Plan* (EOR, 2007) for a description of land and water resources, available data, and associated maps.