Executive Summary

Introduction

The Washington County Water Consortium was established to work with surface and ground water issues that cross local water unit boundaries. It is an ad hoc organization of representatives from watershed districts, joint powers agreement water management organizations (JPAWMOs), cities and townships, the Washington Conservation District, county departments, and state and regional natural resource agencies that serves as a forum for the exchange of information and ideas that could lead to more consistent and efficient water management in the county.

Upon recommendation of the Washington County Water Governance Study, the Water Consortium spent 2002 researching the feasibility of developing common countywide standards for water management. The main objective of the rule review process was to identify those portions of the rules that could be standardized across organizations. The Water Consortium identified three main benefits of having more standard water management rules.

1. It would make it easier for local government units (lgu) that lie in multiple watershed districts if they want to take over the permitting process.
2. It would make it easier for lgus that lie in multiple watershed districts, as the first contact in the development process, to provide information to applicants regarding watershed district rules and regulation.
3. It would assure a higher level of compliance with watershed district rules because lgus, agencies, developers, engineers and residents of the districts would be more familiar with and could more easily understand the expectations.

While recognizing that each watershed district is unique and has its own set of issues, this report identifies a number of common issues that could be addressed in a similar manner. The report recommends areas for standardization but stops short of recommending standardized language. It is hoped that this is the first step in creating more standardized water management regulation throughout the County. The report is not meant to replace the Minnesota Association of Watershed District's Watershed Rulemaking Handbook that guides watershed districts in how to write and adopt effective rules.

Process

In 2002, the Water Consortium met monthly to discuss individual components of watershed district rules. Each meeting included a presentation on the rule component followed by a group discussion. Typically the presenter was an expert on the topic and represented an agency or one of the watershed districts in the county. The group discussion focused on the content of each watershed district's rules, the goals, objectives and effectiveness of watershed management standards, and how the rules could be standardized. Since many of the watershed district rules reference standards contained in the watershed management plan, the information collected and presented at the Water Consortium meetings was supplemented by standards, goals and policies contained in the district's watershed management plans and administrative policy. Only districts with existing rules were included in this review. Table 1 contains a list of the topics and the presenters.

This report documents the findings of the Water Consortium. Each chapter contains the following information for each of the rule components:

- A brief description of the watershed districts authorities to regulate the particular natural resource management issue;

- A table summarizing the information contained in each watershed district's rules and watershed management plan regarding the particular natural resource management issue;
- A list of the key issues identified and discussed at the Water Consortium meeting; and
- A list of recommendations for standardizing portions of the rule addressing the particular natural resource management issue.

TABLE 1.

SUMMARY OF WATER CONSORTIUM MEETINGS

TOPIC	PRESENTER(S)
Coordination of Permits/Administrative Procedures	Cliff Aichinger, Administrator Ramsey-Washington Metro Watershed District
Washington County Groundwater Plan	Jon Michels, Washington County
Erosion and Sedimentation Control	Mark Doneux, Washington Conservation District
Stormwater Runoff: Volume and Rate Control	Cecilio Olivier and Camilla Correll, Emmons & Olivier Resources, Inc.
Shoreland Buffer Activities and Wetland Management	Jeff Berg and Jyneen Thatcher, Washington Conservation District
Greenways and Open Space	Steve Hobbs, Administrator Rice Creek Watershed District Matt Moore, Administrator South Washington Watershed District
Water Appropriation	Julie Westerlund, Department of Natural Resources John Hanson, Engineer Valley Branch Watershed District
Waste Disposal and On-Site Septic Regulation	Cindy Weckwerth, Washington County Public Health Department
Floodplain, Shoreland and Streambank Development	John Hanson, Engineer Valley Branch Watershed District

Rule Making Authority

A watershed district is a special purpose local unit of government established under Minnesota Statutes Chapter 103D. A watershed district's boundary follows the natural watershed or hydrologic boundary draining to a downstream waterbody. The seven watershed districts located wholly or partially within Washington County are: (See Figure 1.)

1. Brown's Creek Watershed District (BCWD)
2. Carnelian-Marine Watershed District (CMWD)
3. Comfort Lake– Forest Lake Watershed District (CLFLWD)
4. Ramsey-Washington Metro Watershed District (RWMWD)
5. Rice Creek Watershed District (RCWD)
6. South Washington Watershed District (SWWD)
7. Valley Branch Watershed District (VBWD)

Each watershed district is governed by a board of managers appointed by the county boards of the counties with land in the watershed district. Projects are funded through the watershed district's taxing authority and, for projects initiated by citizen petitions, by special assessments. Watershed districts are required to adopt watershed management plans which establish the district's goals and objectives. To

implement the plan, watershed districts may adopt rules and regulations and permit certain activities in the district. Of the seven watershed districts located in Washington County, only Comfort Lake-Forest Lake Watershed District does not have rules and regulations.

A joint powers agreement water management organization has the general authorities specified in Minnesota Statutes Sections 103B.211 through 255 and specific authorities agreed to through a joint powers agreement between the municipalities and townships within the watershed area. The four JPAWMOs located in Washington County are: (See Figure 1.)

1. East Mississippi Water Management Organization
2. Lower St. Croix Water Management Organization
3. Marine on St. Croix Water Management Organization
4. Middle St. Croix Water Management Organization

Each JPAWMO is governed by a board appointed by the member municipalities and townships. JPAWMOs do not have individual taxing authority unless their joint powers agreement specifically grants this authority; most rely upon funding from the municipalities that make up their membership. Like watershed districts, JPAWMOs are required to adopt watershed management plans which establish the organization's goals and objectives. While JPAWMOs have the authority to adopt and implement rules under the conditions set forth in Minnesota Statute. 103B.211, Subd. 1(a) (3) none of the JPAWMOs in Washington County have elected to exercise this authority.

Table 2 contains contact information and the status of the rules for each watershed district and JPAWMO.

TABLE 2.

STATUS OF RULES
WATER MANAGEMENT ORGANIZATIONS IN WASHINGTON COUNTY

WATER MANAGEMENT ORGANIZATION	CURRENT RULES ADOPTION DATE	WATERSHED DISTRICT CONTACT
Brown's Creek Watershed District	October 28, 1999	Karen Kill, Washington Conservation District Contract Administrator, 651-275-1136 ext. 26
Carnelian-Marine Watershed District	June 21, 1982	Dan Fabian, Emmons & Olivier Resources District Engineer, 651-770-8448
Comfort Lake – Forest Lake Watershed District	NA	Paul Haik, Krebsbach & Haik, Ltd WD Attorney/Administrator, 612-333-7400
Ramsey-Washington Metro Watershed District	February 27, 1976	Cliff Aichinger, Staff Administrator 651-704-2089
Rice Creek Watershed District	August 12, 1998	Steve Hobbs, Staff Administrator 763-398-3070
South Washington Watershed District	February 9, 1999	Matt Moore, Staff Administrator 651-714-3729
Valley Branch Watershed District	March 14, 1996	John Hanson, Barr Engineering District Engineer, 651-748-4230
Marine-on-St. Croix JPAWMO	NA	Jim Shaver, Marine on St. Croix resident
Middle St. Croix JPAWMO	NA	Bob Fossum, Washington Conservation District Contract Administrator, 651-275-1136
Lower St. Croix JPAWMO	NA	Jeff Berg, Washington Conservation District Contract Administrator, 651-275-1136 Ext. 23
East Mississippi JPAWMO	NA	Mark Lobermeier, District Engineer

Insert Figure 1
Watershed Districts and Joint Powers Agreement Water Management Organizations Located in Washington County

Conclusions

As the Water Consortium discussed different components of water management rules and regulations it became apparent that the development of standardized rules would be difficult. The content of the watershed district rules will vary depending upon factors such as: urban versus rural land use issues; new development versus re-development; local natural resource management priorities; watershed district staff and resources; and local political issues. For example:

- The Carnelian-Marine Watershed District focuses on the protecting lakes and wetlands, whereas the adjacent Brown's Creek Watershed District focuses more on protecting its namesake, a naturally producing cold water trout stream.
- Districts without staff may want to set higher thresholds for permits.
- Restoring wetlands may be more of a focus in already developed areas while preserving wetlands may be the focus in newly developing areas.

After a thorough review of each watershed district's rules and regulations and watershed management plans, the consortium drew the following general conclusions:

- Standardization will be difficult to achieve because each watershed district and water management organization has its own water and natural resource issues which will ultimately govern the content of their rules.
- At a minimum, using a standard rule format as well as similar language for provisions that can be standardized would go a long way to reaching the goal of making the rules for water management more understandable and predictable. See the following section for a suggested rule format.
- Watershed district rules and regulations should serve as a stand-alone document. While many standards are located in the watershed management plan, as required by the Board of Water and Soil Resources, they should also be included in the rules for ease of use. Watershed district rules should be updated following the adoption of a new watershed management plan or a plan amendment.
- Watershed districts should consider including a technical appendix containing guidelines for meeting standards that are well suited for cold weather climates. These guidelines would make it easier for individuals, developers, contractors and local units of government to comply with the particular watershed district's rules.
- The development of a standard set of rules and regulations could be accomplished if watershed districts when revising their rules, would work with other watershed districts to agree on common language to use for those things that are recommended to be standardized.

A watershed district or JPAWMO should consider the following principles when adopting new rules and regulations or amending existing ones:

- Regulations that are developed should fill existing gaps in the regulatory process, adding value to the existing regulatory framework. Overlaps in regulatory authority should be addressed by identifying respective roles between municipalities/agencies/watersheds/JPAWMOs to avoid duplication and streamline the process.
- The development of a regulatory framework should be consistent with the core functions of a watershed district or JPAWMO as identified in Minnesota Statutes 103B and 103D.
- The development of a regulatory framework should be consistent with the goals and objectives identified in the watershed management plan.
- The rules should be consistent with or exceed existing federal, state and county standards and guidelines.

TABLE 11.

POTENTIAL RULE REVISIONS BY INDIVIDUAL WATERSHED DISTRICTS.

WATERSHED DISTRICT	DATE PLANNED FOR REVISING RULES	MAJOR OR MINOR REVISION ANTICIPATED	COMPONENTS EXPECTED TO BE CHANGED
BCWD	2003	Minor	
CMWD	2003	Minor	Incorporate Second Generation Watershed Management Plan.
RWMWD	2004	Major	Incorporate Third Generation Watershed Management Plan
RCWD	2003	Major	Water quality, volume control, and buffers.
SWWD	Currently revising the rules for adoption in June 2003.	Minor	Floodplain Management, Wetland Regulation and Volume Control.
VBWD	2004	Major	Volume control, minimum floor elevation, permit fee and surety escrow amount.

Proposed Structure of Watershed District Rules

Below is a proposed format for watershed district rules. Use of this format would help achieve consistency in the presentation of the rules so that an individual, a developer, a contractor, or an lgu using the rules would be able to most expeditiously find the most applicable content and requirement. It is suggested that the table of contents identify all potential eventualities or applications of the rules, with those categories where a specific organization does not choose to regulate be indicated with a N/A. Should a later addition or requirement be added, consistency between agencies would be maintained. It is further recommended that the numerical decimal system be used to identify sections in the table of contents and subsequent rules language (for example: 1.0. 1.1.0, 1.1.1.0, 2.0, 2.1.0, etc.).

Statement of Needs and Reasonableness (SONAR) (I*ncorporates any reference to applicable statutes or other authorizing documentation.)*

General Policies

Definitions *(Defines all terms necessary to clarify specific intent and eliminate ambiguity.)*

1.0 Administrative Procedures *(Identifies those who need to apply for permits and the procedure and timeline they must follow to do so; and includes general policy statements, permitted activities, and variance procedures.)*
- **1.1 Policy Statement**
- **1.2 Permitted Activities**
- **1.3 General Standards**

2.0 Stormwater Management *(Contains policies to control quantity of water, permitted activities, and design and maintenance requirements.)*
- **2.1 Rate Control**
- **2.2 Volume Control**
- **2.3 Water Quality**
- **2.4 Waste Disposal to Surface Waters**

3.0 Erosion Control *(Contains permitted activities; design, site preparation and maintenance requirements; and vegetative maintenance requirements.)*

4.0 Lake, Stream and Wetland Buffers/Management *(Defines what is a buffer; identifies permitted deviations and under what conditions; what degree of averaging is allowed and how it will be calculated; includes design and maintenance requirements; and references WCA.)*

5.0 Shoreline and Streambank Alterations *(Defines what is an alteration; includes permitted activities; and references State shoreland standards)*

6.0 Stream and Lake Crossings *(Includes policies and any applicable standards.)*

7.0 Floodplain and Drainage Alterations *(Includes permitted activities; and includes elevations relative to flood plains and restrictions on grading, filling and other alterations.)*

8.0 Landlocked Basins *(Includes recommended elevations for allowed construction relative to OHW, natural outlet elevation, and 100 year event.)*

9.0 Groundwater Management Areas *(Describes role of district and identifies standards for primary groundwater recharge areas and wellhead protection zones.)*

10.0 ISTS Systems *(Describes role of district and identifies standards.)*

11.0 Water Appropriation *(Includes policies and any applicable standards.)*

12.0 Greenways and Open Spaces *(Includes policies and any applicable standards.)*

13.0 Fees

14.0 Sureties and Performance Bonds

15.0 Variances

16.0 Enforcement (Describes how violations are dealt with.)

Administrative/Enforcement Requirements

Authority

Minnesota Statute 103D authorizes watershed districts to adopt rules to regulate, conserve and control the use of water resources within a watershed district. Responsibility for enforcement of standards could be given to the cities and townships once they have adopted the necessary controls and completed their local water management plans. As provided for by Minnesota Rules 8410.0110 Subpart 3, local units of government may meet certain local water planning requirements by adopting the district's water management plan, or parts thereof, by reference.

Key Issues

- If the watershed district receives the development plans late in the approval process, it is difficult to get the developer to modify the plan. Ideally, the city would contact the watershed district when it first receives a set of concept plans so the watershed district could provide comments early in the planning process. This is difficult in fast growing communities that issue a large number of permits.
- Although communities are exempt from paying the watershed district fees, some communities feel that they should also be exempt from the watershed district's rules for city projects.
- Administrative timelines will vary from district to district depending on the frequency of board meetings and whether the watershed district uses its own staff or retains the services of an engineering consulting firm for completing the permitting process.
- Establishing a standard timeline for the permitting process may be difficult to achieve because of differing timelines for the local unit of governments permitting process.
- City development objectives are sometimes inconsistent with natural resource limitations making it difficult to reach consensus on water management requirements.
- Many areas of the watershed district are governed by townships and small cities with little or no staff. In these cases, few options are available for informing landowners of the watershed district's permitting requirements.
- It is difficult to legislate a process to coordinate with communities. A cooperative working relationship needs to be developed.

Recommendations

The following areas of the rules could be standardized:

- A standard threshold for what triggers a permit, being sensitive to the requirements of those communities that fall within the individual watershed district.
- The duration that a watershed district permit is active.
- The method for calculating permit fees and sureties and the way they are applied. However, the actual fees may vary because the cost basis may vary from district to district.
- The process for waiving a fee or a surety.
- The method for dealing with a permit violation.
- The method for determining when a project is complete and how to close a project, including tasks such as final site inspection, determination of outstanding fees, returning the surety to the developer, etc.

TABLE 3.

COMPARISON OF ADMINISTRATIVE/ENFORCEMENT PROCEDURES

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
GENERAL					
No specific language addressing this issue.	No specific language addressing this issue.	Permits not required within cities with approved water mgmt plans and local controls, except where District is the lgu for Wetland Conservation Act. *(Rule Sect.1.C)*	No specific language addressing this issue.	Permits not required within cities with approved water mgmt plans and local controls, except where District is the lgu for Wetland Conservation Act. *(Rule Sect. I. Subd. 3. C.)*	No specific language addressing this issue.
Permit application accepted only after preliminary approval granted by lgu. *(Rule 1.4)*	No specific language addressing this issue.	Review coordinated with communities, county and state and federal agencies. *(Rule Sect. III, Subd 1, E)*	Application accepted anytime. Review is coordinated with lgu. *(Rule Sect. III. Subd. 1. B)*	Review coordinated with communities, county and state and federal agencies. District submits comments to lgus; requirements included in community permit. *(Rule Sect. II. Subd. 1. E)*	Requires proof that applications have been submitted for all other required permits.
TIMELINES					
Complete application required 28 days before Board meeting. *(Rule 1.7)*	No specific language addressing this issue.	Complete application required 14 days before Board meeting. *(Section IV, Subd 1)*	Applications are required 3 weeks prior to the meeting. *(Administrative Policy)*	Complete application required 14 days before Board meeting. *(Rule Sect. XIII. Subd. 1)*	Complete application required 13 days before meeting. *(Administrative Policy)*
Permit must be acted upon within 45 days. *(Rule 1.3)*	Permit must be acted upon within 60 days. *(Rule Sect. 4.d)*	Permit must be acted upon within 60 days. *(Rule Sect. IV, Subd 5)*	Permit generally acted upon within 30 days. *(Rule Sect. III. Subd. 1 D.)*	Permit must be acted upon within 50 days. *(Rule Sect. XIII. Subd. 5)*	Permit must be acted upon within 60 days. *(Rule B. 3)*
Valid for 1 year. *(Rule 1.9)*	Valid for 1 year. *(Rule Sect. 4.c)*	Valid for up to 3 years unless work is not initiated within one year or project is idle for 1 yr. *(Rule Sect. III, Subd 2, B)*	Valid for 1 year if not initiated. *(Rule Sect. VI. Subd. 8)*	Valid for up to 3 years unless work is not initiated within one year or project is idle for 1 yr. *(Rule Sect. II. Subd. 2. B)*	Valid for 18 months. *(Rule B. 5)*
Extensions and transfers may be allowed. *(Rule 1.9)*	No specific language addressing this issue.	No specific language addressing this issue.	No specific language addressing this issue.	No specific language addressing this issue in the rules, however, the standard VBWD permit condition is that it is not transferable.	Extensions and transfers may be allowed. *(Rule B. 6)*

TABLE 3.

COMPARISON OF ADMINISTRATIVE/ENFORCEMENT PROCEDURES

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
VARIANCES					
Variance procedure and criteria specified. *(Rule 10.0)*	Variance procedure and criteria specified. *(Rule Sect. 4.l)*	Variance procedure and criteria specified. *(Rule Sect. XII)*	Variance procedure and criteria specified. *(Rule Sect. VI.)*	Variance procedure and criteria specified. *(Rule Sect. XII)*	Variance procedure and criteria specified. *(Rule L)*
No specific language addressing this issue.	Must be acted upon within 50 days. *(Rule Sect. 4.l)*	Must be acted upon within 60 days. *(Rule Sect. XII, Subd 2, B)*	Must be acted upon within 30 days. Denials cannot be resubmitted for 6 months. *(Rule Sect.VI. Subd. 3, Subd. 6)*	Must be acted upon within 50 days. *(Rule Sect. XII. Subd. 2. B)*	No specific language addressing this issue.
Void after one year. *(Rule 10.3)*	No specific language addressing this issue.	Void after one year, unless used. *(Rule Sect. XII, Subd 2, C)*	Void after one year, unless used. *(Rule Sect. VI. Subd.8)*	Void after one year, unless used. *(Administrative Policy)*	Void after one year, unless used. *(Rule L. 2)*
NOTIFICATION					
Applicant supplies list of landowners within 600 feet; District sends notification. Alternate process available. *(Rules 1.5 and 1.6)*	May require proof of notification of neighbors. *(Rule Sect. 4.i)*	No specific language addressing this issue.	No specific language addressing this issue.	Developments are posted on the web site.	No specific language addressing this issue.
FEES					
Fee equal to the District's actual costs of field inspection of the work, including investigation of the area affected by the work, analysis of the work, services of a consultant, including engineering and legal consultants, and any subsequent monitoring of the work, which in the case of a violation are incurred after notice of a violation. Inspection fees shall be at	Set effective 6-4-2001. *(Fee schedule.)* The Managers may order required work done and assess the costs against the affected property as a special assessment. *(Rule Sect. 8)*	Fees set annually to defray costs of review, inspection and administration. *(Rule Sect. 1.B.2)*	Fees set and adjusted as needed. *(Administrative Policy)*	Fees set annually to defray costs of review, inspection and administration. *(Section I. Subd. 3. B)*	Fees set in rule. *(Rule B. 7)*

TABLE 3.

COMPARISON OF ADMINISTRATIVE/ENFORCEMENT PROCEDURES

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
least $35. *(Rule 8.3)*					
Government agencies exempt from paying fee. *(Rule 8.6)*	No specific language addressing this issue.	Gov't agencies exempt, but contractor puts up escrow or cash sureties. *(Rule Sect. XII, Subd 1)*	Gov't agencies exempt from fees but are required to get permits. *(Administrative Policy)*	Gov't agencies exempt, but contractor may be required to put up escrow or cash sureties. *(Rule Sect. II. Subd. 2 C)*	Gov't agencies exempt from the fee but requires contractor to get permit. *(Rule B. 7)*
No specific language addressing this issue	Minimum: $25 Residence: Less than 1 ac: $25 More than 1 ac: $100/ac Shore land/wetland restoration: $25 alteration: $250 Bridge/culvert crossing: Carnelian or Silver Creeks: $500 all others: $250 Subdivision: minor: $25/lot major: $150 + $25/lot *(Fee schedule)*	No specific language addressing this issue	Permit processing fee: $500. Escrow deposit: $320 - $2500 depending on size, land use, wetland impacts. *(Fee schedule)*	Permit Type: Activities less than 1 acre that require a permit as defined by District rules: $50 Plat approval with no Grading: $500 Grading Permit 1 to 4.99 acres: $800 5 to 20 acres: $1,000 20 or more acres: $1,500 Projects with wetland or floodplain areas – with no proposed alteration to the wetland areas: $1,500 Project adjacent to Category I or II wetlands: $1,500 Projects proposing wetland alterations and all replacement plans: $2,500 *(Fee schedule)*	Land Development: less than 10 lots: $250 10-99 lots: $500 100 or more lots: $750 Drainage plans: less than 1 ac imp. surface: $150 more than 1 ac imp. surface: $500 Bridge or culverts Rice, Clearwater, Hardwood creeks and public ditches: $500 all other crossings: $150 Streets and utilities: $500 Surface water appropriation: $50 All other permits: $150 Wetland replacement or banking: addt'l $500 *(Rule B. 7)*

TABLE 3.

COMPARISON OF ADMINISTRATIVE/ENFORCEMENT PROCEDURES

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
SURETIES					
May require a performance bond, letter of credit or other surety in a form approved by the District. *(Rule 9.2.1)* Amount is set by Board on a case-by-case basis to cover application, field inspection, monitoring and related costs; implementing and maintaining protective measures required in the permit; costs of remedying damage resulting from permit noncompliance. *(Rule 9.3)*	May require posting of escrow or a bond. *(Rule Sect. 4.h*)	May require a performance bond, letter or credit or other security. Escrow deposit to be determined by mgrs. *(Sect. 1.B.1)*	May require a performance bond, escrow, or cash surety. *(Rule Sect. VII)*	May require a performance bond. *(Rule Sect. XI.)* Escrow deposit to be determined by mgrs *(Rule Sect. II. Subd. 2. A)*	May submit a performance bond or letter of credit if surety is above $5000. *(Rule B. 8. b)*
Surety must be valid and in force for at least a one-year period and shall contain a provision that it may not be canceled or released. Release procedures incl. *(Rule 9.2.3)* Surety shall be in favor of the District and conditioned on performance of the activities authorized in the permit in compliance with all applicable laws. *(Rule 9.2.2)*	Will require a performance surety. Board may waive requirement. All permitted activities: $200 + $50/ac Subdivisions minor: $500 major: $1000+$150/lot Wetland alteration: $500 Storm water mgmt and erosion control: 125% of construction costs *(Fee schedule)*	No specific language addressing this issue.	No specific language addressing this issue.	Cash surety in proportion to the size and type of disturbed area. *(Rule Sect.I. Subd. 3. B. 2)* Applicant shall post a cash surety or letter of credit equal to 150% of the estimate construction cost of the replacement wetland. *(Sect. IX. Subd.5.B)*	Cash Surety – amounts set in rule. *(Rule B. 8. b)* The surety shall be in favor of the District and conditioned upon performance of activities authorized in the permit. *(Rule B. 8.)* Release procedures included. (*Rule B. 8*)
No specific language	No specific language	Letter of credit may be	No specific language	Letter of credit for wetland	No specific language

TABLE 3.

COMPARISON OF ADMINISTRATIVE/ENFORCEMENT PROCEDURES

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
addressing this issue.	addressing this issue.	required and will be proportional to the size and type of disturbed area. *(Rule Sect. I, Subd 3, 3 and Sect. XII, Subd 1)*	addressing this issue.	replacements. *(Rule Sect. I. Subd. 3. B. 3)*	addressing this issue.
ENFORCEMENT					
Violation of rules is a misdemeanor. *(Rule 11.1)*	Violation of rules is a misdemeanor. *(Rule Sect. 8)*	Violation or rules is a misdemeanor. *(Rule Sect. XIV, Subd 4)*	Violation of rules is a misdemeanor. *(Administrative Policy)*	No specific language addressing this issue.	Violation of rules is a misdemeanor. *(Rule K. 1)*
May exercise all powers granted under M.S. Chapter 103D. *(Rule 11.2)*	May exercise all powers granted under M.S. Section 112 (MN Stat 103 D) *(Rule Sect. 8)*	May exercise all powers granted under M.S. Chapter 103D. *(Rule Sect. XIV, Subd 1)*	May exercise all powers under M.S. Chapter 103D. *(Rule Sect. VIII. Subd. 1)*	Will exercise all powers under M.S. Chapter 103. *(Rule Sect. XIV. Subd. 1*)	May exercise all powers under M.S. Chapter 103. *(Rule K. 2*)
May issue a cease and desist order if a proposed project presents a serious threat of flooding, soil erosion, sedimentation, or adverse effect on water quality or otherwise violates any Rules of the District. *(Rule 11.3)*	No specific language addressing this issue.	May issue a cease and desist order if a project is a threat of adverse effects on water quality. *(Rule Sect. XIV, Subd 6)*	Will seek cease and desist from District Court if violations are not corrected after written notice, or ask City to issue. *(Administrative Policy)*	No specific language addressing this issue.	May issue a cease and desist order if a project is a threat of adverse effects on water quality. *(Rule K. 3*)
RELATIONSHIP WITH OTHER GOVERNMENTS					
No specific language addressing this issue.	Copies of proposed lgu ordinances relating to surfaces water drainage, land use zoning, shore land use, and floodplain regulation shall be submitted to the District managers 30 days prior to the first public hearing for	Recognizes that primary control of land uses is responsibility of lgu. Requests lgus to submit preliminary plats to District for comment. lgus shall file with District for comment ordinances, development guides and	Requires lgus to submit to District within 45 days after adoption ordinances relating to surface water drainage, shore land use and flood plain zoning; and municipal drainage plan and development guide. *(Rule Sect. IV. Subd. 2. B.)*	lgus are the primary vehicles for submission of proposed improvements to the District. *(Rule Sect. II. Subd. 1. B*) lgus shall submit copies of developer's agreements and/or grading permits. *(Rule Sect. IV. Subd. 1. B)*	lgus are the primary control and determination of land uses. District will coordinate reviews with lgus. *(Rule Introduction)*

TABLE 3. COMPARISON OF ADMINISTRATIVE/ENFORCEMENT PROCEDURES					
BCWD	**CMWD**	**SWWD**	**RWMWD**	**VBWD**	**RCWD**
	review and comment, and within 45 days after passage of the ordinance. *(Rule Sect. 6)*	plans for land alteration, surface drainage, flood plain mgmt, and shore land mgmt. *(Rule Sect. I)*		Requires lgus to submit to District after adoption ordinances, plans and development guides relating to land alteration, surface water drainage, shore land mgmt. and flood plain mgmt. *(Rule Sect. IV. Subd. 2 A.)*	
No specific language addressing this issue.	No specific language addressing this issue.	Intends to serve as technical advisors to lgus in preparing surface water mgmt plans and reviewing development proposals. *(Rule Sect. I)*	Will assist lgus in preparing drainage plans and development guides. *(Rule Sect. I. Subd. 3)*	Will assist lgus in preparing local water mgt plan and land development guides. *(Rule Sect. II. Subd. 1. A)*	Will serve as technical advisor to lgus in preparing surface water mgmt plans. *(Rule Introduction)*
No specific language addressing this issue.	Adopts by reference waste disposal rules of State Board of Health and PCA. *(Rule Sect. 6.a)*	No specific language addressing this issue.	No specific language addressing this issue.	No specific language addressing this issue.	No specific language addressing this issue.

Stormwater Management

Authority

The regulation of stormwater management is authorized by a number of specific watershed district purposes: "to control or alleviate damage from flood waters" (Minn. Stat. § 103 D. 201 Subd. 2(1)) and "to protect or enhance the water quality in watercourses or water basins" (Minn. Stat. § 103 D. 201 Subd. 2(13)). Effective stormwater management includes regulating the quality and quantity (rate, volume and water quality) of stormwater entering lakes, rivers, wetlands and groundwater resulting from unmanaged stormwater runoff. Non-point source pollution is one of the main sources of water quality deterioration. As stormwater runoff travels across the landscape, it picks up pollutants, depositing them into lakes, rivers, wetlands, as well as the groundwater system. This runoff also increases in temperature as it travels across hot impervious surfaces resulting in thermal impacts to downstream waterbodies. Unmanaged, stormwater runoff also contributes to water quantity issues such as flooding, streambank erosion and reduced groundwater recharge.

Key Issues

- Adopting volume control standards may pose legal challenges.
- It may be feasible to apply different volume control standards in different areas depending upon the objectives of the watershed district. For example, a volume control rule meant to reduce streambank erosion may be different than a volume control standard meant to prevent flooding in a landlocked basin or one meant to encourage groundwater recharge. Also different standards may be needed for urban and rural development patterns.
- Volume control standards could be very beneficial when applied to landlocked basins**,** specifically with respect to flooding and outletting of these basins.
- The short- and long-term maintenance requirements, specifically with respect to stormwater infiltration practices differ from more traditional stormwater management practices (e.g. NURP ponds).
- Monitoring of infiltration practices is a critical means of evaluating performance and the effect of short- and long-term maintenance.
- The performance of infiltration basins under frozen ground conditions is a concern. The design of an infiltration practice needs to be evaluated using the 10-day snowmelt (runoff) event.
- Opinions differ over the use of published values versus field-verified infiltration rates in the design of infiltration practices. The South Washington Watershed District uses field-verified rates and has measured infiltration rates in a number of depressions since 1997.
- An emergency overflow for volume control practices is a critical design parameter.
- The aesthetics of volume control practices and management under dry versus wet conditions is a concern.
- Because different watershed districts are using different hydrologic models and have drastically different land covers, the group did not agree that all districts should use the same base level design events for standards.
- In addition to reducing the volume of runoff generated by impervious surfaces, stormwater infiltration provides the additional benefits of groundwater recharge, reduced thermal impacts to downstream water bodies, and maintaining/reducing impacts to stream morphology/integrity. However, the potential negative impacts of infiltrating stormwater runoff on groundwater quality are a watershed district concern.

Recommendations

- All watershed districts select the same condition (existing, pre-settlement or some intermediate condition) to use in comparing against post-development conditions for the rate and volume control standards. Although consensus favored using the pre-settlement condition, most districts currently use existing conditions. In rural areas, pre-settlement and existing conditions might be the same, but in urban areas they are not. Requiring redevelopments to conform to pre-settlement standards might be difficult.
- All watershed districts apply the same base level design events to the rate, volume control and water quality standards unless special conditions warrant a higher standard (e.g. landlocked basins or cold water trout stream). The MN Pollution Control Agency is encouraging watershed districts to adopt the 2-, 10- and 100-year 24-hour rainfall events as the standard design events unless specific watershed conditions warrant additional design events.
- All watershed districts consistently reference the same best management practices guidance manual. The following guidance manuals are highly regarded and should be considered as standard:
  - *Protecting Water Quality in Urban Areas, Best Management Practices for Dealing with Stormwater Runoff from Urban, Suburban and Developing Areas*, MPCA, 2000
  - *Minnesota Small Sites BMP Manual, Stormwater Best Management Practices for Cold Climates*, Met Council/Barr Engineering Company, 2001
- Apply stormwater management rules to re-development in the watershed. Develop a definition of re-development and a methodology for evaluating re-development sites that is consistent among watershed districts (e.g. what level of re-development triggers a watershed district permit, which stormwater management standards will apply to re-development projects and to what degree will the standards be applied).
- Watershed districts work with communities and other agencies to develop rules that deal with the cumulative impacts of the phased development of several small projects by one (or several) developers/landowners in the same geographic area. Planned urban developments (PUDs) and the Lake Elmo Airport were mentioned as examples of these types of problems. Watershed districts could encourage communities to use the alternative urban areawide review process authority in Chapter 4410, The Environmental Quality Board Environmental Review Rules to address these situations.
- Organize the stormwater management standards under the headings: rate control standards, volume control standards, surface water quality standards, and waste disposal to surface waters standards.

TABLE 4.

COMPARISON OF STORMWATER RUNOFF REGULATIONS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
POLICY STATEMENT					
It is the policy of the District to: ▪ Promote on-site infiltration of stormwater; ▪ Limit peak off-site stormwater flow to pre-development rates; ▪ Limit off-site stormwater flow volume to prevent down-gradient flooding and thermal impacts to Brown's Creek and its tributaries; and ▪ Require management of stormwater flow to limit sediment, nutrient and metals concentrations conveyed to ground and surface waters and promote water quality. *(Rule 2.1)*	The District shall require natural infiltration of runoff where practical. *(WMP Sect. IV.E.7.b(4))* The District shall require that peak stormwater discharge from any single watershed development or group of subwatersheds tributary to a conveyor, wetland, pond, detention basin or lake shall not exceed the undeveloped, pre-settlement discharge volume and peak discharge rate. *(WMP Sect. IV.E.7.b(6))* The District shall require that stormwater discharge nutrient concentrations be in accordance with the District's water quality goals and performance standards, as presented in the 2000 Overall Plan. *(WMP Sect. IV.E.7.b(7))* The District shall promote the use of pervious surfaces in new development. *(WMP Sect. IV.E.7.b(7))* The District shall establish impervious surface limits	To be informed of all water discharges. All discharges: ▪ Must conform to applicable requirements of state and federal agencies; ▪ Must conform to the District and community water management plans; ▪ Shall not unreasonably raise water levels or degrade water quality. *(Rule Sect. IX. Subd.1)* To implement the goals and policies of the District's Plan. *(Rule Sect. XI. Subd. 1)*	Developments shall not cause a significant change in the rate or quality of surface water runoff from the developed area. *(Rule Sect. I. Subd.5)*	To be informed of all water and wastewater discharges. All discharges and related improvements must: ▪ Be in conformance with state and federal regulations and the District's and communities' water management plans; and ▪ Shall not unreasonably raise water levels or degrade water quality. *(Rule Sect. VIII. Subd.1)* To implement the goals and policies of the District's plans. *(Rule Sect. X. Subd. 1)*	To manage stormwater and snowmelt runoff and promote natural infiltration: ▪ Provide treatment prior to discharge to surface water bodies and wetlands; ▪ Ensure that future peak rates are less than or equal to existing rates; and ▪ Maximize infiltration and control runoff volume increase. Require stormwater facilities to be constructed on individual sites where regional facilities are not available. *(Rule C.1)*

TABLE 4. COMPARISON OF STORMWATER RUNOFF REGULATIONS					
BCWD	**CMWD**	**SWWD**	**RWMWD**	**VBWD**	**RCWD**
	on new development in priority subwatersheds, as necessary, in order to meet the water quality goals of the District's water resources. *(WMP Sect. IV.E.7.b(8))*				
APPLICABILITY – PERMITTED ACTIVITIES					
▪ Residential subdivision or development of four or more lots; ▪ Non-residential development creating impervious surface that, in the aggregate, exceeds one acre or five percent of a site; ▪ Redevelopment on a site of five acres or more, where pervious surface is disturbed and final impervious surface, in the aggregate, exceeds one acre or five percent of a site; ▪ The creation of 5,000 square feet or more of additional impervious surface appurtenant to existing non-residential development; ▪ The creation of road,	A District permit is required for all proposed: ▪ Subdivision land developments; ▪ Road improvement projects; ▪ Within 1000-foot shoreland zone modifications or improvements; ▪ Mining operations; ▪ Variances to Washington County Shoreland Ordinances. *(WMP Sect. V)*	Land alterations such as grading or filling which remove, cover, or disturb a surface area of 1 acre or more will require a District permit. *(Rule Sect. IX. Subd.2.A)*	A permit shall be obtained from the Managers prior to the start of any construction or land development involving disturbance of 1 acre or more of ground cover including ditching, grading and/or stripping which would: (a) remove topsoil and/or vegetation, or (b) increase, concentrate, or dispose of runoff water on a temporary or permanent basis which might cause or increase erosion. *(Rule Sect. III.Subd.2.B.1)* All preliminary plats of property. *(Rule Sect. IV. Subd.1.A)* All plans for highway, road, bridge, and culvert construction, including water inlets, culvert openings and bridge approaches.	All projects which result in a discharge of municipal or industrial water or wastewater to a surface water drainage system. All projects which create a new impervious surface of 6,000 square feet or greater. *(Rule Sect. VIII. Subd. 2)*	All new development, re-development, or additions to existing sites. *(Rule C.2)*

TABLE 4.

COMPARISON OF STORMWATER RUNOFF REGULATIONS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
bikeway, sidewalk or other linear impervious surface of one acre or more. *(Rule 2.2)*			*(Rule Sect. IV. Subd.1.D)*		
RATE CONTROL STANDARDS					
Proposed land-altering activity will not: ▪ Increase peak stormwater flow fro the site for a 24-hour precipitation event with a return frequency of 1.5, 10, or 100-years in the subwatershed drainage area in which the site is located. *(Rule 2.4)* An applicant may be required to demonstrate that downgradient stormwater conveyance structures and features will be adequate to handle proposed peak flow or flow volume from the site. *(Rule 2.4.3)*	For basins with a defined outlet the SCS 24-hour Type II distribution storm event shall be the minimum design storm. For basins which are landlocked the SCS 10-day Runoff (snowmelt) shall be the minimum design storm used to determine flood levels and storage volume requirements. *(WMP Sect. IV.F.1.(c))* Peak discharge from a developed area shall be limited to the pre-development peak discharge for the 2-year, 10-year and 100-year critical storm events. *(WMP Sect. IV.F.1.(d))*	Any permitted activity shall be consistent with local water management plans and the District's Allowable Peak Flow Rate Standards in its Plan for 100-year events. *(Rule Sect. IX. Subd.3.A)* The watershed management plan (WMP) establishes allowable peak discharge rates at key locations within the watershed based upon the 24-hour 100-year rainfall event unless otherwise noted. *(WMP Sect. VI.B.1)*	No significant change in the rate or quality of surface water runoff from that developed area for the 2-, 10- and 100-year storm event, including snowmelt. *(Rule Sect. IV. Subd.2.F)* The WMP establishes allowable peak discharges and maximum flood levels for each drainage area for the 2-, 10-, and 100-year storm event and the critical snowmelt event. *(WMP Sect. 3.1 & Sect. 5)*	Activities shall not increase the rate of surface water runoff from property for precipitation events of all durations including the 2-, 10-, and 100-year storm events. *(Rule Sect. VIII. Subd.3.A)*	Runoff rates must not exceed pre-project runoff rates for the critical 1- or 2- and 100-year frequency. *(Rule C.3.b)*
VOLUME CONTROL STANDARDS					
Proposed land-altering activity will not: ▪ Increase stormwater	The volume of discharge shall be limited to the pre-development discharge	The following Interim Infiltration Standards will apply to landlocked and	No specific language addressing this issue.	No specific language addressing this issue.	<u>2-Step Process</u> ▪ Minimize imperviousness;

TABLE 4.

COMPARISON OF STORMWATER RUNOFF REGULATIONS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
flow volume from the site for a 24-hour precipitation event with a return frequency of 1.5 years, excepting the increased flow resulting from impervious cover on five percent of the site possessing average site permeability. *(Rule 2.4)*	volumes for the 2-year and 10-year storm events. *(WMP Sect. IV.F.1.(d))*	semi-landlocked subwatersheds outside of the Metropolitan Urban Service Area that is adopted as of February 9, 1999 until an infiltration or volume control policy is developed and adopted. ▪ Maintain the quality and quantity of runoff to pre-development levels; ▪ Stormwater quantity must be limited to pre-development volumes only to be adjusted by the watershed where pre-existing land-use zoning makes minor increases necessary. In all cases, infiltration management techniques shall be used to maximize infiltration. *(Rule Sect. IX Subd. 3.D)*			▪ Address the use of BMPs designed to infiltrate the impervious surface runoff from the Mpls-St. Paul median storm (0.34 inches) in seventy-two hours. *(Rule C.3.k)*
WATER QUALITY STANDARDS					
Proposed land-altering activity will not "at the downgradient property boundary, increase the site loading of total suspended solids, total nitrogen or heavy metals, or contribute to a stormwater phosphorous concentration that exceeds the inflow concentration" which	▪ Class I Protection Lakes – Designed discharge into a District-designated Protection Lake or associated lateral conveyor shall exhibit a 10% reduction in annual phosphorous loading (lbs/yr) from existing conditions;	For wetlands that fall within the *Protect* or *Manage I* category, allowed to discharge stormwater with phosphorous loads that are 75% greater than predevelopment loads. For wetlands that fall within the *Manage 2* or *Urban Management* category, allowed to discharge	Depending upon wetland management classification, required to construct a permanent dual purpose (PDPB) or wet detention basin (WDB). Water quality requirements for PDPB are total suspended solids (TSS) removal of 80% and total phosphorous (TP) removal	The required amount of treatment that stormwater runoff needs to receive prior to its discharge into VBWD waterbodies varies depending on the water body category. *(WMP Sect. 3.2.5)* For Level V waterbodies (wetlands) applicant required to provide	Wetlands may be used for stormwater storage and treatment only if applicant demonstrates that the excavation will not adversely affect the function and value of the wetland, and will not substantially increase sediment load, tributary area, or water level

TABLE 4.

COMPARISON OF STORMWATER RUNOFF REGULATIONS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
ranges from 170 to 250 ppb. *(Rule 2.4.(c))*	▪ Class II Improvement Lakes – shall exhibit a 25% reduction in annual phosphorous loading (lbs/yr) from existing conditions. ▪ Class III Management Lakes – shall exhibit a no-net-increase in annual phosphorous loading (lbs/yr) from existing conditions. *(WMP Sect. IV.F.2.(a))*	stormwater that meets predevelopment concentrations. *(WMP Sect.VI.Subd.3.)*	of 50%. For WDB, TP removal of 55% and TSS removal of 85%. *(WMP Sect.3.4.)*	sedimentation and skimming but not nutrient removal. *(WMP Sect.3.4.)*	fluctuations. *(Rule F.3.(c).)*
WASTE DISPOSAL STANDARDS					
No specific language addressing this issue.	No refuse, garbage, or noxious materials shall be dumped in any public waters or where the natural run-off or overflow drain into and be cast upon public waters. *(Rule Sect.5.H.)*	No specific language addressing this issue.	No septic tank or other waste disposal facility shall outlet directly or indirectly into any lake, watercourse, or public or private drain. *(Rule Sect.V.Subd.1.(1).*) No entity shall dispose of any human, animal, or industrial waste directly or indirectly into any lake or stream, public or private drainage system or road ditch. *(Rule Sect.V.Subd.1.(2).)* No waste of any kind shall be disposed of by underground pumping. *(Rule Sect.V.Subd.1.B.)*	No specific language addressing this issue.	No specific language addressing this issue.

TABLE 4.

COMPARISON OF STORMWATER RUNOFF REGULATIONS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
BEST MANAGEMENT PRACTICES					
No specific language addressing this issue.	The District shall require the implementation, where appropriate, of the Best Management Practices and Methods set forth in the MPCA publication "Protecting Water Quality in Urban Areas, Best Management Practices for Minnesota" *(WMP Sect. IV.F.2)*	Best Management Practices shall meet the standards established in the Watershed Management Plan for runoff water quantity and quality management and erosion control plans. *(Rule Sect. IX. Subd.3.C)*	WMP requires use of Ramsey Erosion & Sediment Control Manual for BMP selection and implementation for all permitted projects. *(WMP Sect .3.2. Policy 4.1)* 2002 Board Resolution amends WMP to require use of Met Council Small Sites BMP Manual in place of Ramsey Erosion and Sediment Control Manual. *(Board Policy 2002)*	Best Management Practices shall meet the standards established in the Watershed Management Plan. *(Rule Sect. VIII. Subd.3.G)*	Development resulting in the creation of impervious surfaces must explicitly address the use of best management practices (BMPs) to first limit the loss of pervious area; and second, to infiltrate runoff which does occur from impervious areas to the extent feasible considering site-specific conditions. Identifies types of BMPs. *(Rule C.3.k)*
FREEBOARD REQUIREMENTS					
In addition to all other legal requirements that may apply, all land-altering and related stormwater management activity pursuant to Rule 2.0 shall comply with building elevation requirements of Rule 7.0 *(Rule 2.5.7)* All new residential, commercial, industrial, and institutional buildings shall be constructed such that the lowest basement floor elevations are at a	The District shall require all new development or major redevelopment to provide a minimum of 2 feet of freeboard between the 100-year flood elevation and the low floor elevation of all structures adjacent to natural or man-made ponding areas. The freeboard required for landlocked basins shall be 3 feet from the established 100-year flood elevation or known high water elevation, whichever is higher.	The SWWD requires that ponding areas be designed to provide a minimum of two feet of freeboard from the 100-year high water level to the lowest opening of a structure. *(WMP Sect. VI. B.1)*	2 foot minimum freeboard required to low floor elevation from critical 100-year flood elevation identified for drainage area. Exceptions provided for special circumstances. *(WMP Sect. 3.1 & Sect. 5)*	Adjacent to all waters of the District, the Managers shall set the minimum building elevation at two feet above the 100-year flood elevation. The minimum building elevation for each lot shall be noted in the grading plan. *(Rule Sect. V. Subd.3.B)*	All new residential, commercial, industrial and other habitable or non-habitable structures must be constructed so that the lowest floor elevations are a minimum of two feet above the critical event 100-year high water elevation and are one foot above the overflow elevation of nearby surface waterbodies, wetlands and stormwater basins. Within landlocked basins, lowest floor elevations must be at least one foot above the

TABLE 4.

COMPARISON OF STORMWATER RUNOFF REGULATIONS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
minimum of two (2) feet above the 100-year high water elevation. *(Rule 7.3)*	*(WMP Sect. IV.E.8.b(3))*				surveyed basin overflow elevation. *(Rule C.3.j)*
REQUIRED EXHIBITS					
Required exhibits contained in the Rules. *(Rule 2.6)*	No specific language addressing this issue.	No specific language addressing this issue.	No specific language addressing this issue.	Required exhibits for the Runoff Water Management Plan identified in the WMP. *(WMP Sect. 3.2.5.3.a)*	No specific language addressing this issue.
DESIGN REQUIREMENTS					
Allows two methods to demonstrate off-site flows: SCS TR-20 and direct estimate using soil permeability classes. *(Rule 2.5.3)*	A hydrograph method based on sound hydrologic theory (i.e. SCS hydrology) shall be used to analyze stormwater runoff for the design or analysis of flows in conveyors, streams, and channels and flows to ponds and wetlands. *(WMP Sect. IV.F.1(a))*	No specific language addressing this issue.	A hydrograph method based on sound hydrologic theory (i.e. SCS hydrology) shall be used to analyze stormwater runoff for the design or analysis of flows in conveyors, streams, and channels and flows to ponds and wetlands. *(WMP Sect. 5 pg. 20)* All calculations checked by District Engineer using District model. Discrepancies resolved in District's favor. *(Administrative Procedure)*	Runoff rates should be calculated by accepted design methods. Applicants must submit calculations showing that runoff rate is not increased in events up to the 100-year recurrence interval for storms of any duration. *(Rule Sect. VIII Subd.3.D)* The runoff curve number for existing agricultural areas shall be less than or equal to the developed conditions curve number. *(Rule Sect. VIII Subd.3.E)*	A hydrograph method based on sound hydrologic theory must be used to analyze runoff. *(Rule C.3.a)* Analysis of flood levels, storage volumes, and flow rates for waterbodies and detention basins must be based on the range of rainfall and snow melt durations which produces the critical (highest) flood levels and discharges. *(rule C.3.d)*
Site-based stormwater management methods shall be used in the following sequence: ▪ Site design practices; ▪ On-site infiltration;	Although the District's policy is to manage its water resources using the regional detention basins concept, sound management occasionally	Infiltration management techniques should be used to maximize infiltration. *(Rule Sect. IX. Subd.3.D)* Where runoff from urban	Regional detention basins will be utilized to manage peak flow rates and meet water quality objectives where possible. On-site detention basins will be	Stormwater ponding areas for parking lots with more than 10 parking spaces and for motor vehicle service facilities shall incorporate a skimming device capable	Regional detention basins will be utilized to manage peak flow rates and meet water quality objectives where possible. On-site detention basins will be

TABLE 4.

COMPARISON OF STORMWATER RUNOFF REGULATIONS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
▪ Off-site infiltration; ▪ Wet detention in accordance with NURP standards; ▪ Other methods. *(Rule 2.5.1)*	requires the use of on-site detention basins to meet stormwater runoff and water quality objectives. When on-site detention basins are required, these basins shall: ▪ Conform to the District's stormwater runoff criteria for discharge rate and volume; ▪ Conform to the District's water quality performance standards; ▪ Have water quality features designed to meet the water quality requirements for downstream resources; ▪ Have an outlet control structure that effectively prevents floating debris from entering the downstream conveyor system. *(WMP Sect. IV.F.2(b))*	land is contributing pollutant, all efforts should be made to abate the impurities. Where this is impractible, filters, ponds, or constructed treatment wetlands will be constructed. *(Rule Sect. XI. Subd.3.B)* Stormwater ponds draining into DNR protected wetlands, District priority wetlands, or infiltration basins shall incorporate a skimming device capable of retaining floating liquids and debris. *(Rule Sect. XI. Subd.3.C)*	utilized when regional basins are not in place or are not feasible. *(WMP Sect. 5 pg. 22)* Detention basin design standards are provided for all situations where required for water quality and flood control. *(WMP Sect. 5 pg. 22-25)*	of retaining floating liquids and debris. *(Rule Sect. VIII Subd.3.F)* Discharges resulting from the modification of the outlet of landlocked basins shall not flow into landlocked areas of other communities more frequently than once every 100 years on the average. *(Rule Sect. VIII Subd.3.C)* Design considerations for on-site detention basins include: ▪ Permanent pool volume below the principal spillway (normal outlet) shall be ≥ to the runoff from a 1.0-inch 24-hour storm over the entire contributing drainage area assuming full development. ▪ Permanent pool avg. depth (basin volume/basin area) shall be ≥ 4 feet, with max depth of ≤ 10 feet. ▪ Emergency spillway adequate to control	utilized when regional basins are not in place or are not feasible. *(Rule C.3.c)* Detention basins musty be designed to provide: ▪ An outlet structure to control the 1-, 2-, and 100-year frequency events to pre-project peak runoff rates; ▪ An identified overflow spillway sufficiently stabilized to convey flows greater than the 100-year critical storm event; ▪ Access for future maintenance. Permanent sedimentation and water quality ponds are required and must be designed to provide: ▪ Water quality features consistent with NURP criteria and District wet pond criteria; ▪ A permanent wet pool with dead storage of at least equal to the runoff from a 2.5 inch rainfall over the area tributary to the pond;

TABLE 4. COMPARISON OF STORMWATER RUNOFF REGULATIONS					
BCWD	**CMWD**	**SWWD**	**RWMWD**	**VBWD**	**RCWD**
				the 100-year frequency critical duration rainfall or runoff event. ▪ Basin side slopes above the NWL no steeper than 3:1. Basin shelf minimum width of 10 feet and 1 foot deep below the NWL. ▪ To prevent short-circuiting, distance between the major inlets and normal outlet shall be maximized. ▪ Sufficient flood pool (live storage) volume above the principal spillway shall be provided so that the peak discharge from the 100-year frequency, critical duration storm is not greater than the peak discharge for a similar storm and predevelopment watershed conditions. ▪ An extended detention of runoff from the more frequent (1-year to 5-year) storms shall	▪ An outlet structure capable of preventing migration of floating debris and oils for at least the 1-year storm; ▪ Access for future maintenance. *(Rule C.3.e)*

TABLE 4. COMPARISON OF STORMWATER RUNOFF REGULATIONS					
BCWD	**CMWD**	**SWWD**	**RWMWD**	**VBWD**	**RCWD**
				detain the runoff hydrograph at least 24 hours and shall be achieved through a principal spillway design which shall include a perforated vertical riser, a small orifice or a multi-stage outlet. ▪ Effective energy dissipation devices which reduce outlet velocities to 4 fps. ▪ Skimming devices shall be placed on the outlet to provide treatment up to the critical duration 5-year storm event. ▪ Waterborne sediment shall be prevented from leaving the site during and after construction. ▪ Runoff Water Management Plans prepared under this Rule shall be in conformance with approved municipal water management plans. *(WMP Sect. 3.2.5)*	

TABLE 4. COMPARISON OF STORMWATER RUNOFF REGULATIONS					
BCWD	**CMWD**	**SWWD**	**RWMWD**	**VBWD**	**RCWD**
MAINTENANCE REQUIREMENTS					
Requires a stormwater management facility maintenance agreement to be filed with the County. *(Rule 2.5.5)* Any conditions of the permit shall be recorded with the County. *(Rule 2.5.6)*	No specific language addressing this issue.	Stormwater ponds will require long-term maintenance by the pond owner or designated responsible entity, including field inspection every 5 years and inlet/outlet inspections every 2 years. *(Rule Sect. XI. Subd.3.D)*	Sediment basins should be excavated to original design configuration when storage capacity is reduced by mire than 10%. *(WMP Sect. 8 pg. 24)*	Drainage easements required up to the 100-year flood level of all waters. The community in which the easement is located is responsible for all maintenance within it. *(Rule Sect. V. Subd.3.C.1)*	All stormwater management structures and facilities must be properly maintained to assure that they continue to function as originally designed. This maintenance responsibility must be assumed either by the municipality's accepting the required easements dedicated to stormwater management purposes, or by the applicant executing and recording a maintenance agreement acceptable to the District. *(Rule C.3.m)*
EXCEPTIONS					
If the District finds that site design practices and on-site infiltration do not suffice to maintain stormwater flow volume off-site at the level specified in paragraph 2.4(b), the applicant will be excepted from strict compliance with that paragraph. *(Rule 2.7.1)* The District may grant an exception to the	No specific language addressing this issue.	Traditional agriculture is generally exempt except for drainage diversion and alterations. *(Rule Sect. IX. Subd. E)*	No specific language addressing this issue.	No specific language addressing this issue.	Development or redevelopment of individual sites less than 2.5 acres in size for industrial, commercial, and multi-unit residential, and less than five acres in size for single-family residential, unless such development of redevelopment: ▪ Is within the 100-year floodplain; ▪ Is within 1, 000 feet of

TABLE 4.

COMPARISON OF STORMWATER RUNOFF REGULATIONS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
sequencing requirements on an applicant's demonstration that an alternative management technology or method would achieve the same levels of performance. *(Rule 2.7.2)*					a public water or protected wetland; ▪ Is within 300 feet of Rice Creek, Clearwater Creek, Hardwood Creek, or a public ditch. Exceptions listed for special circumstances are listed in the rule. *(Rule C.6)*
VARIANCES					
The District may grant a variance to any requirement of Rule 2.0 under Rule 10.0. An exception shall be limited to the extent necessary to put the property to a reasonable or economically viable use. *(Rule 2.7.3)*	The Board of Managers may grant variances from District rules and policies only if extraordinary or unnecessary hardship will result from strict compliance. *(WMP Sect. V.C)*	A variance to the interim implementation of the standards will be considered by the Board in the case of undue hardship or if a comprehensive analysis and approach is developed for a given area by the SWWD. *(WMP Sect. VI. B)* Managers may grant variances from Rules when they find that due to unique physical conditions of the land or waters involved, extraordinary and unnecessary hardship may result from strict compliance. *(Rule Sect XIII Subd. 1 A)*	The Board of Managers shall have the power to grant variances from these Rules and Regulations where they find that extraordinary and unnecessary hardships may result from strict compliance with these Rules and Regulations; provided that such variances do not have the effect of nullifying the intent and purpose of these Rules and Regulations and the overall plan of the District as adopted. *(Rule Sect. VI Subd.1)* Variance and dispute resolution process provided in WMP. *(WMP Sect. 5 pg. 18-19)*	The Managers may grant variances from these Rules and Regulations when they find that due to unique physical conditions of the land or waters involved, extraordinary and unnecessary hardship may result from strict compliance. *(Rule Sect. XI. Subd.1)*	The Board of Managers may hear requests for variances from the literal provisions of these rules in instances when their strict enforcement would cause undue hardship because of circumstances unique to the property under consideration. *(Rule L.1)*

Erosion and Sedimentation Control

Authority

The regulation of erosion and sedimentation is authorized by the specific watershed district purpose "to control or alleviate soil erosion and siltation of watercourses or water basins" (Minn. Stat. § 103 D. 201 Subd. 2(10)). Although erosion and sedimentation control is universally accepted as a major concern, the Water Consortium participants agreed that erosion control is inadequate on a majority of sites. Agreement on acceptable erosion control practices is complicated by the various perspectives: soil scientists try to keep soil in place; foresters build buffers to try to hold back the soil; and engineers build sedimentation ponds to sift out the suspended soil particles.

Key Issues

- Erosion control practices are typically adequate during the early phases of the construction process (e.g. mass grading of the site). It is often the post development activities (e.g. residential home construction) that create the most problems.
- Enforcement is a major issue. Watershed districts don't have the authority to shut down a project if the appropriate erosion control practices are not being used. To do so, a watershed district would have to obtain a court injunction by demonstrating that irreparable harm has been caused to the downstream resource. A more effective approach may be to coordinate with communities.
- In communities where erosion control is not a priority, the appropriate erosion control measures are not being used resulting in degradation of downstream resources. In some communities erosion control plans are inadequate and inspection and enforcement is lacking.
- Many communities lack the capacity to deal with the erosion control. Often these communities lack the budgets and staff required to write effective erosion control standards and plans.
- Most watershed districts include a list of general provisions/conditions in the watershed district permit, including standards that are not contained in the watershed district rules or management plan. As a result, there is inconsistency between the watershed district's rules and the provisions/conditions identified in the permit.

Recommendations

- Set a goal of 80 percent reduction in sediment for all watershed districts.
- Require a surety for erosion and sedimentation control to provide for the implementation and enforcement of erosion control standards in the event that the contractor does not fulfill the district's requirements.
- Develop a uniform policy on which land alterations would trigger an erosion control permit to make it easier for applicants to understand the expectations. As Table 5 indicates, most watershed districts have the same or similar thresholds for triggering an erosion control permit (e.g. land alterations disturbing 1 acre or more of a site).
- All watershed district rules consistently reference the same erosion and sedimentation control manual. The following guidance manuals should be considered as standard:
  - *Protecting Water Quality in Urban Areas, Best Management Practices for Dealing with Stormwater Runoff from Urban, Suburban and Developing Areas,* MPCA, 2000
  - *Minnesota Small Sites BMP Manual, Stormwater Best Management Practices for Cold Climates,* Met Council/Barr Engineering Company, 2001
  - *Ramsey Soil Erosion and Sediment Control Handbook, Ramsey Soil and Water Conservation District*

- Develop a minimum standard list for all watershed districts to use (e.g. rock construction entrance standard, riprap at stormsewer outlets, erosion control blanket on slopes that are 3:1 or greater, revegetation specifications, implementation schedule, etc.)
- Working more closely with local officials, coordinating the watershed district permitting process with issuance of county and local building and grading permits may increase the effectiveness of the program.
- Consider Chapter 14 of the Dane County Code of Ordinances, Creating an Erosion Control and Stormwater Ordinance as a standard for Washington County. Key purposes this ordinance are to:
  - Achieve an 80% reduction in sediment load rates to Dane County waters compared to no controls for all new development, a 40% reduction in sediment load rates compared to no controls for all redevelopment and street reconstruction, and a 20% reduction in sediment load rates compared to no controls for existing developments.
  - Ensure no increase in temperature of stormwater post-construction in order to protect cold water communities.
  - Ensure no increase in the rate of surface water drainage from sites during or after construction.

  This ordinance requires permits for the following activities:
  (1) Land disturbing activity in excess of 4,000 square feet.
  (2) Land disturbing activity on a slope of greater than 12%.
  (3) Land disturbing activity that involves the excavation or filling, or a combination of excavation and filling, in excess of 400 cubic yards of material.
  (4) Land disturbing activity that disturbs more than 100 lineal feet of road ditch, grass waterway or other land area where surface drainage flows in a defined open channel; including the placement, repair or removal of any underground pipe, utility or other facility within the cross-section of the channel.
  (5) Any new public or private roads or access drives longer than 125 feet.
  (6) Development that requires a subdivision plat, as defined in the applicable local land division ordinance(s).
  (7) Land disturbing activity that disturbs less than 4,000 square feet of land, including the installation of access drives, that the local approval authority determines to have a high risk of soil erosion or water pollution, or that may significantly impact a lake, stream, or wetland area.

  All stormwater management provisions of this ordinance apply, to any of the following activities within Dane County:
  (1) Any development(s) after the adoption date of this ordinance that result(s) in the cumulative addition of 20,000 square feet of impervious surface to the site;
  (2) Any development that requires a subdivision plat, as defined in applicable local land division ordinance(s);
  (3) Any development that requires a certified survey map, as defined in the applicable local land division ordinances(s); for property intended for commercial or industrial use;
  (4) Redevelopment, as defined in s. 14.41(31), shall meet the following stormwater management performance standards: 14.51(2)(a)(2), (2)(b), (2)(d), (2)(e), and (2)(f).
  (5) Other land development activities, including but not limited to redevelopment or alteration of existing buildings and other structures, that the local approval authority determines may significantly increase downstream runoff volumes, flooding, soil erosion, water pollution or property damage, or significantly impact a lake, stream, or wetland area. All such determinations shall be made in writing unless waived by the applicant.

  For more information about this ordinance contact: Jeremy Balousek, Dane County Land Conservation,1 Fen Oak Court, Room 208, Madison, WI 53718 (608-224-3747).

TABLE 5.

COMPARISON OF EROSION AND SEDIMENTATION CONTROL STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
POLICY STATEMENT					
To require erosion control for land development activities to prevent the siltation and sedimentation of streams, lakes, wetlands, and ground water recharge areas in the District. *(Rule 3.1*)	To control and alleviate land and soil erosion and siltation of the watercourses of the District. *(Rule Sect. 5.g.)*	To minimize the erosion which can occur as a result of land alteration. *(Rule Sect. VII.Subd.1.A.)* Under no circumstances will erosion and siltation of infiltration basins be allowed. *(Rule Sect. VII Subd. 3.B.8)* Erosion reaching landlocked or semi-landlocked depressions and areas identified by the District as regional infiltration areas must be minimized. *(Rule Sect. VII.Subd.2.E)*	To achieve 100% compliance with construction site erosion, sedimentation and runoff BMPs as defined by the *Ramsey Soil Erosion and Sediment Control Handbook.* *(WMP Sect.3.2)* Amended to Metropolitan Council Small Sites BMP Manual. *(Board Policy 2002)*	To minimize the erosion which can occur as a result of land alteration (*Rule Sect. VI.Subd.1.A.)*	To prevent erosion of soil into surface water systems by requiring preparation and implementation of erosion control plans for land disturbance activities. *(Rule D.1)*
PERMITTED ACTIVITIES					
Land alterations disturbing more than 50 cubic yards of earth or removal of vegetative cover on 5,000 square feet. *(Rule 3.2*)	Any excavations, grading or filling near any drainage way, lake or marsh. *(Rule Section 7.c.)* The District shall require erosion and sediment control plans to be prepared and submitted for review and approval as part of the permitting process for all construction projects that disturb one acre or more of vegetated cover *(WMP*	Land alterations disturbing 1 acre or more. *(Rule Sect. VII.Subd.2.A.)* Required for: ▪ Projects which disturb more than 1 acre of surface vegetation ▪ Projects which could be expected to introduce sediment to the water resources of the District. *(Rule Sect. VII.Subd.3.A)*	Construction or land development disturbing 1 acre or more which would: ▪ Remove top soil and/or vegetation, or ▪ Increase, concentrate or dispose of runoff water on a temporary or permanent basis, which might cause or increase erosion. *(Rule Sect. III Subd.2.B.1)*	Land alteration, which remove or cover surface vegetation of 1 acre or more. *(Rule Sect. VI. Subd. 2. A)* Required for: ▪ Projects which remove or cover more than 1 acre of vegetation. ▪ Projects which could be expected to introduce sediment to the waters of the District.	New development, redevelopment or additions to an existing site. *(Rule D.2*)

TABLE 5.

COMPARISON OF EROSION AND SEDIMENTATION CONTROL STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
	Sect. IV.E.6.b(2)) and for all construction projects, regardless of size, that are within the 1,000-foot shoreland area or within 300 feet of a wetland, or where adjacent streets are served by curb and gutter, and projects that affect critical erosion areas as determined by the Washington Conservation District. *(WMP Sect. IV.E.6.b(3))*			*(Rule Sect. VI.Subd.3.A*)	
SUBMITTAL REQUIREMENTS					
An erosion control plan must be prepared by a qualified individual showing proposed methods of retaining waterborne sediments on site during the period of construction and showing how the site will be restored, covered, or revegetated after construction, including a timetable for completion. *(Rule 3.2.1)*	An erosion control plan and accompanying implementation schedule. *(WMP Sect. V.E.D)*	No specific language addressing this issue.	Shall include a description of erosion control measures to be followed during and after construction, a work schedule and a timetable. *(Rule Sect. III Subd.2.B.2)*	Shall include commonly accepted restoration methods. *(Rule Sect. VI. Subd. 3.B.3)*	No specific language addressing this issue
REFERENCE STANDARDS					
Plan shall be consistent with the specifications of the MPCA manual "Protecting Water Quality in Urban Areas". *(Rule 3.2.2.)*	The construction plans shall conform to MnDOT Standard Practices, the Board of Water and Soil Resources publication entitled, "Minnesota Construction Site Erosion	Plan shall include methods defined by the MPCA's erosion and sediment control policies and standards. *(Rule Sect.VII.Subd.3.B.1*)	Increase coordination with cities to ensure that all land disturbance activities and public works projects comply with the standards, criteria and methods of *Ramsey Soil Erosion and*	Minimum guidelines are BWSR's "Minnesota Construction Site Erosion and Sediment Control Planning Handbook" and the SCS's "Fact Sheets". *(Rule Sect. VI.Subd.3.B.1)*	Plan shall be consistent with the specifications of the MPCA manual "Protecting Water Quality in Urban Areas". *(Rule D.3.b)*

TABLE 5.

COMPARISON OF EROSION AND SEDIMENTATION CONTROL STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
	Control and Sedimentation Handbook", and the CMWD 1992 Overall Plan. *(WMP Sect. IV.F.2(c))* The District shall require erosion control plans to implement the MPCA's Best Management Practices (BMPs) for the site conditions involved and shall consider erosion resulting from flowing water, wave action and wind. *(WMP Sect. IV.E.6.b(7))*		*Sediment Handbook. (WMP Sect. 3.2)* Amended by Board Policy to Metropolitan Council Small Sites BMP Manual. *(Board Policy 2002)*		
EXHIBIT REQUIREMENTS					
No specific language addressing this issue.	No specific language addressing this issue.	No specific language addressing this issue.	Required exhibits identified in the permit application information packet.	Required exhibits addressed in the watershed management plan. *(WMP Sect. 3.2.5.3.b)*	Required exhibits listed in the Rules and permit information brochure. *(Rule D.4)*
STANDARD – SITE PREPARATION					
Erosion control measures such as silt fence and hay bales shall not be removed until after the project is complete. *(Rule 3.2.4*)	Erosion and sediment control measures shall be installed prior to alteration and maintained until turf is established. *(Rule Sect. 7.c.)*	All measures shall be installed prior to alteration and maintained until turf is established. *(Rule Sect.VII.Subd.3.B.6*)	All measures shall be installed prior to alteration and maintained until turf is established. *(Standard permit provision)*	Erosion and sediment control measures shall be installed prior to alteration and maintained until turf is established. *(Rule Sect. VI.Subd.3.B.5)*	Erosion and sediment control measures shall be installed prior to alteration and maintained until turf is established. *(Rule D.3.c)* Natural site topography and soil conditions must be considered to reduce erosion and sedimentation during and after construction. *(Rule*

TABLE 5.

COMPARISON OF EROSION AND SEDIMENTATION CONTROL STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
					D.3.a.)
STANDARD – TREATMENT MEASURE					
Permanent wet detention basins must be cleaned out after construction is completed. *(Rule 3.2.3*)	No specific language addressing this issue in the rules.	No specific language addressing this issue in the rules.	All stormwater must be pretreated prior to discharges to a wetland consistent with treatment requirements for each wetland classification. *(WMP Sect. 3.4)*	Sedimentation ponds are required upstream of all wetlands where grading activities are proposed. All structures shall be designed in accordance with the erosion control plan requirements of the District's Water Management Plan. *(Rule Sect.VI.Subd.3.B.2.)*	Site erosion and sediment control practices must be consistent with recommendations of the Best Management Practices identified in the MPCA's "Protecting Water Quality in Urban Areas", and to be sufficient to retain sediment on site. *(Rule D.3.b)*
STANDARD – FLOW CONTROL					
No specific language addressing this issue in the rules.	Watercourses shall be constructed with proper side slope and bed slope, and water inlets and outlets, culvert openings and bridge approaches shall have adequate shoulder and bank protection. *(Rule Sect. 5.g.a. and b.)*	No specific language addressing this issue in the rules.	No specific language addressing this issue in the rules.	Water quality treatment facilities need effective energy dissipation devices which reduce outlet velocities to 4 fps or less. Velocities through baffled weir devices shall be less than 0.5 fps. *(WMP Sect. 3.2.5)*	No specific language addressing this issue in the rules.
STANDARD - VEGETATIVE STABILIZATION					
No specific language addressing this issue in the rules.	Disturbed areas shall be seeded and mulched: ▪ within 14 days after final grading ▪ if not to be developed immediately, within 14 days of being disturbed *(Rule Sect. 7.c.)*	Sites having greater than 1 acre exposed entering the winter season shall restore or protect those areas. Seed and mulch is required where grading activities are completed before October 1. Dormant seed and mulch	Disturbed areas shall be seeded and mulched: ▪ within 14 days after final grading ▪ if not to be developed immediately, within 14 days of being disturbed *(Standard permit*	Disturbed areas shall be seeded and mulched: ▪ within 14 days after final grading ▪ if not to be developed immediately, within 14 days of being disturbed *(Rule Sect.VI.Subd.3.B.4.)*	The project must be phased as best possible to minimize disturbed areas and removal of existing vegetation until necessary for project progress. *(Rule D.3.c*)

TABLE 5.

COMPARISON OF EROSION AND SEDIMENTATION CONTROL STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
		is required where grading activities are completed after Oct. 1. Areas where grading is not completed by winter, but where construction is to continue the following spring shall be covered by a straw mulch. *(Rule Sect.III.Subd.3.B.3)*	*provisions)*		
STANDARD – INSPECTION					
Permittee shall inspect, maintain and repair all disturbed areas and erosion control facilities: ▪ Every day work is performed on site, ▪ At least weekly, until land-disturbing activity has ceased and ▪ Weekly until vegetative cover is established. *(Rule 3.2.6)*	No specific language addressing this issue.	The District staff shall be notified 3 days prior to commencement of grading to schedule an inspection. *(Rule Sect.VII.Subd.3.B.6*)	No specific language addressing this issue.	The District staff shall be notified 3 days prior to commencement of grading to schedule an inspection. *(Rule Sect. VI.Subd.3.B.5)*	Permittee will inspect project sites after every rainfall event exceeding 0.5 inches and implement erosion and sediment control measures as needed. *(Rule D.3.c)* The District inspector may require the permit applicant to provide additional erosion control measures where site conditions warrant. *(Rule D.3.c)*
STANDARD – MAINTENANCE					
Permittee shall remove silt fences and hay/straw bales within 14 days of project completion. *(Rule 3.2.4)* The permittee is responsible at all times for maintenance	No specific language addressing this issue.	All construction-related sediment shall be removed from all ponding areas every 2 years as the development is constructed and upon completion of the construction (when 85%	Persons carrying out the permitted activity and all subsequent owners of the property shall maintain all erosion control features. *(Section III.Subd.2.B.(3)*	All construction related sediment shall be removed from all ponding areas upon completion of construction. *(Rule Sect. VI. Subd.3.B)* Permit applicant shall	Silt fences will be removed after all disturbed areas have been permanently stabilitized. *(Rule D.3.d)*

TABLE 5. COMPARISON OF EROSION AND SEDIMENTATION CONTROL STANDARDS					
BCWD	**CMWD**	**SWWD**	**RWMWD**	**VBWD**	**RCWD**
and proper operation of all erosion and sediment control facilities. *(Rule 3.2.6)*		of all buildings shown on the final grading plan have been constructed and issued a certificate of occupancy. *(Rule Sect.VII.Subd.3.B.7)* Managers will require action to correct problems. *(Rule Sect. VII.Subd.2.C.)*		remove all temporary measures upon completion of the project. *(Rule Sect. VI. Subd.1.6)* Managers will require action to correct problems. *(Rule Sect. VI.Subd.2.C.)*	
EXEMPTIONS					
Permit not required for land used for agricultural activity, provided that a grass or natural vegetation buffer extends 16 feet or width of a shore impact zone, whichever is wider, is maintained along any water body or wetland and no fertilizer is used in the zone. *(Rule 3.3)*	No specific language addressing this issue.	Permit not required for traditional agricultural practices – District will coordinate with SWCD to encourage good conservation practices. *(Rule Sect. VII.Subd.2B.)*	No specific language addressing this issue.	Permit not required for usual agricultural practices; District will encourage good conservation measures. *(Rule Sect. VI.Subd.2.B.)*	Permit not required for development or redevelopment of individual sites less than 2.5 acres in size for industrial, commercial, and multi-unit residential, and less than 5 acres in size for single-family residential, unless such development or redevelopment: ▪ Is within 100-yr floodplain ▪ Is within 1000 feet of public water or protected wetland, or ▪ Is within 300 feet of Rice Creek, Hardwood Creek, Clearwater Creek, or of a public ditch. *(Rule D.5.a.)*

Wetland Management

Authority

Wetlands are subject to a number of regulatory authorities. On the federal level, wetlands are regulated by the Corp of Engineers under authority of the Clean Water Act. On the state level, wetlands are regulated by the Department of Natural Resources. Wetlands are also regulated by a variety of local government units under the 1991 Wetland Conservation Act (WCA). The DNR regulates activities below the Ordinary High Water level (OHW) of Protected Waters as defined by state statute. The WCA applies to all other wetlands as well as wetland areas occurring above the OHW of Protected Waters.

Watershed districts began protecting wetlands primarily as a way to minimize flooding problems. Wetlands were seen as a valuable resource for storing and slowly releasing stormwater. As watershed districts began to manage water quality, protecting wetlands again became a key strategy. The regulation of lake, stream and wetland buffers is authorized by a number of specific watershed district purposes: "to regulate improvements by riparian property owners of the beds, banks, and shores of lakes, streams, and wetlands for preservation and beneficial public use" (Minn. Stat. § 103 D. 201 Subd. 2(11)) and "to protect or enhance the water quality in watercourses or water basins" (Minn. Stat. § 103 D. 201 Subd. 2(13)). Watershed districts are also authorized to be the administering agency for the WCA. Currently the Ramsey Washington Metro, Rice Creek and Valley Branch watershed districts serve as the local government unit (lgu) to administer WCA.

Many watershed districts have adopted additional wetland regulations such as more restrictive mitigation requirements, water quality standards and buffer requirements.

Key Issues

- Washington County has three types of wetlands: 1) lakeshore/shoreland; 2) floodplain and flow-thru; and 3) isolated basins (potholes). Each type of wetland has its own function. It can be difficult maneuvering through the rules and determining which agency regulates a particular wetland.
- Wetland governance could be simplified if each watershed district in the county became the lgu for the WCA. This would also have the potential of strengthening wetland protection for the following reasons:
  1. Typically watershed districts have more expertise and resources to manage wetlands than municipalities;
  2. Watershed districts don't have competing interests such as protecting an economic tax base or implementation of projects that would impact wetlands (e.g. road construction); and
  3. Management of wetlands on a watershed basis versus a municipal basis keeps losses and gains within the same hydrologic boundary thereby providing more flexibility to the regulated community.
- Current watershed district rules address filling of and surface drainage to wetlands but do not address impacts to wetlands caused by the disruption of groundwater flow. One example of an unregulated situation is the high-quality fen discovered in the Brown's Creek Watershed District, where protecting the source of water for the wetland is an issue.
- Wetland rules should stress wetland functions and values, as well as wetland acreage.
- The health of a wetland is largely dependent upon its adjacent upland. Wetland buffers are critical to protecting the functions and values of wetlands.

Recommendations

- For watershed districts that are the lgu for the WCA, recommend that standard language adopting the WCA in its entirety be included in the district's rules. This would eliminate the need to reiterate portions of WCA unless the language is more restrictive or varies from WCA standards.
- Establish minimum buffer widths and create a flexible system that includes provisions for buffer averaging and for varying restrictions within the buffer (e.g. three zone buffer system).
- Thoroughly explain the limits and uses of the buffer system and the requirements expected for any development plan during the entire development process (e.g. restored buffer widths vs. no-disturb buffer widths).
- Include any waivers or variances (e.g. varying width of the buffer) that may be granted regarding the buffers in the rules and standardize these waivers or variances.
- Require buffers to be recorded as an easement with the plat and denoted on the development plan.
- Require the demarcation of wetland buffers in the field.
- Include maintenance guidelines and enforcement procedures for buffer violations.

TABLE 6.

COMPARISON OF WETLAND MANAGEMENT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
POLICY STATEMENT					
Natural vegetation bordering the bed and banks of lakes, streams and wetlands serves a critical role in maintaining the ecological function of and societal benefits deriving from those water resources…to afford the greatest possible protection to these buffers, and to the water quality, flow regime and habitat of Brown's Creek and its tributaries, consistent with the interest in avoiding undue disturbance to established public and private activities in littoral and riparian zones. *(Rule 4.0.)*	To preserve wetlands for beneficial use. *(Rule Sect.5.i.)*	To enable the standards adopted in the water plan for water quality of storm water entering wetlands and for buffer zones around wetlands, based on their functional value. *(Rule Sect.X.Subd.1.B.)*	To preserve marshes for beneficial use … *(Rule Sect. III. Subd. 2.C.(1).)* Manage wetlands to achieve no net loss of acreage, function and value and maintain the complex ecosystems that serve a variety of functions and values, including improving water quality and providing flood storage, wildlife habitat, open space and aesthetics. *(WMP Sect. 3.4.)*	Continued wetland protection through implementation of the WCA and VBWD's Rules and Regulations. *(WMP Sect. 3.4.1.)*	To achieve no net loss in and to avoid direct or indirect impacts from activities that destroy or diminish the quantity, quality and biological diversity of wetlands. To increase the quantity, quality, and biological diversity of wetlands by restoring or enhancing diminished or drained wetlands. Replace wetland values where avoidance of activity is not feasible and prudent. *(Rule F.1.)*
SERVES AS LGU FOR WCA					
Not lgu for WCA. No formal policy statement in rules or watershed management plan.	Regulation of wetlands in the District is left to individual townships and cities or lgus. *(WMP Sect. III Wetlands Management Plan)*	Not lgu for WCA. No formal policy statement in rules or watershed management plan.	Serves as lgu for majority of the District (excluding St. Paul) but has no formal policy statement.	Serves as lgu but has no formal policy statement.	The District intends to serve as the "local government unit" for administration of the Minnesota Wetland Conservation Act, unless a particular municipality in the District has elected to assume that role in its jurisdictional area.

TABLE 6. COMPARISON OF WETLAND MANAGEMENT STANDARDS					
BCWD	**CMWD**	**SWWD**	**RWMWD**	**VBWD**	**RCWD**
					(Rule F.4.)
LANGUAGE SPECIFYING PERMIT REQUIREMENTS					
No specific language addressing this issue.	Permit required for draining wetlands. *(Rule Sect.5.i.)*	Permit may be required for filling, draining, ditching, or dredging a wetland and altering the vegetation or grades of the buffer zone. *(Rule Sect.X.Subd.C.)*	Permit required for draining or filling wholly or partially or otherwise disturbing marshes. *(Rule ect.III.Subd.2.C.(1).)*	Permit required for all projects which result in a wetland impact. *(Rule Sect. I. Subd.3.A.7)*	Permit is required to fill, drain, excavate or alter a wetland. *(Rule F.2.)*
APPLICATION					
No specific language addressing this issue.	The District will regulate through permitting the alteration of any District wetland, type 2 through 8, 0.5 acres or larger in size, any shoreline wetland and any wetland identified by the District as pristine or high value. *(WMP Sect. IV Subd. E.4.11.)*	Rules apply to waters that are defined under the WCA rules. *(Rule Sect.X.Subd.2.)*	Rules apply to wetlands defined under WCA. *(WMP Sect.3.4.)*	Rules apply to wetlands defined under WCA. *(Rule Sect.IX.Subd.2. and Subd.3.B.)*	Rules apply to wetlands defined under WCA. *(Rule F.3.(a).)*
ACTIVITIES REGULATED					
No specific language addressing this issue.	No specific language addressing this issue.	The following activities may require a District permit: filling, draining, ditching, dredging and altering the vegetation or grades of the buffer zone surrounding a wetland. *(Rule Sect.X.Subd.1.c.)*	The following activities may require a District permit: filling, draining, ditching, and dredging. *(WMP Sect.3.4.)* And any WCA regulated activity.	Permit required for all projects which result in a wetland impact. *(Rule Sect. I. Subd.3.A.7)*	Permit is required to fill, drain, excavate or alter a wetland. *(Rule F.2.)*
SEQUENCING					
No specific language addressing this issue.	No specific language addressing this issue.	Requires sequencing, replacement plans, and	Sequencing standards dependent upon wetland	Requires sequencing, replacement plans, and	No specific language addressing this issue.

TABLE 6.

COMPARISON OF WETLAND MANAGEMENT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
		banking to favor preservation, restoration, and creation of wetlands and buffers in high priority areas as defined by the District: areas defined as high priority in the WMP, minor watersheds having less than 50% of original wetlands, and additional areas defined by local water plan. *(Rule Sect.X.Subd.3.E.)*	management classification: flexibility in the sequencing process allowed for lower quality wetlands and the application of enhanced avoidance and sequencing standards to higher quality wetlands. *(WMP Sect. 3.4)*	banking to favor preservation, restoration, and creation of wetlands in high priority areas as defined by the District: water plan, minor watersheds having less than 50% of original wetlands, and areas defined by local water plan. *(Rule Sect.IX.Subd.3.E.)*	
MITIGATION					
No language addressing this issue.	All wetland replacements shall be within the legal boundaries of the CMWD and be of same quality, type and function. *(WMP Sect. IV Subd. E.4.6)*	Requires all mitigation or replacement wetlands to be located within the District, except for modification or expansion of existing public roads. *(Rule Sect.X.Subd.3.C.)*	No specific language addressing the location of mitigation stated in the rules or watershed management plan. Mitigation standard dependent upon wetland management classification. Minimum 2:1 replacement of acreage with additional mitigation standards depending upon wetland quality. *(WMP Sect. 3.4)*	Requires replacement wetlands to be located within the District, unless District approves otherwise. *(Rule Sect.IX.Subd.3.C.)*	No specific language addressing this issue.
BANKING					
No specific language addressing this issue.	No specific language addressing this issue.	Allows state banking, as defined in WCA, to be	The District will use the State of Minnesota	Allows state banking, as defined in WCA, to be	No specific language addressing this issue.

TABLE 6. COMPARISON OF WETLAND MANAGEMENT STANDARDS					
BCWD	**CMWD**	**SWWD**	**RWMWD**	**VBWD**	**RCWD**
		used. *(Rule Sect.X.Subd.3.D.)*	Wetland Bank. *(WMP Sect. 3.4 Policy 5.11)*	used. *(Rule Sect.IX.Subd.3.D.)*	
TECHNICAL EVALUATION PANEL					
No specific language addressing this issue.	No specific language addressing this issue.	The District shall appoint a person to serve on the technical evaluation panel in accordance with WCA Rules part 8420.0240. The person must be a technical professional with expertise in water resources management. When applicable, a professional employee of the local municipality will be considered as a member of the technical evaluation panel. *(Rule Sect. X. Subd. 4)*	No specific language addressing this issue.	The District shall appoint a person to serve on the technical evaluation panel in accordance with WCA Rules part 8420.0240. The person must be a technical professional with expertise in water resources management. When applicable, a professional employee of the local municipality will be considered as a member of the technical evaluation panel. *(Rule Sect. IX. Subd. 6)*	No language addressing this issue.
REFERENCE TO WCA					
No specific language addressing this issue.	Incorporates, by reference, WCA and MN Rules Chapter 8420. *(WMP Sect. III Wetlands Management Plan)*	Incorporates, by reference, WCA and MN Rules Chapter 8420. *(Rule Sect.X.Subd.1.)*	Incorporates, by reference, WCA and MN Rules Chapter 8420. *(WMP Sect. 3.4.)*	Incorporates, by reference, WCA and MN Rules Chapter 8420. *(Rule Sect.IX.Subd.1.A.)*	Incorporates, by reference, MN Rules Chapter 8420. *(Rule F.3.a.)*

TABLE 6.

COMPARISON OF WETLAND MANAGEMENT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
EXCAVATION STANDARDS					
No specific language addressing this issue**.**	The District shall require a zero net negative impact on pristine and high value wetlands which have been identified by the District. *(WMP Sect. IV. Subd. E.4.8)*	Permits excavations when the District wetland standards for functions and values apply as defined by the water plan; requires a buffer strip for District identified high priority wetlands as described in the Plan around the delineated wetland boundary. *(Rule Sect.X.Subd.5.G.)*	Apply WCA standards. *(WMP Sect.3.4.)*	Permits excavations if the existing wetland is an isolated basin, all contiguous property owners join the application, no more than 50% of the wetland is impacted, the excavated spoil material is not to be placed within the wetland, and the wetland is of a relatively low function and value for the region or area. *(Rule Sect. IX. Subd. 4.I.)*	Excavations for wildlife enhancement must comply with "General Design Consideration for Wildlife Pond Construction and Wetland Alterations". *(Rule F.3.b.)* May be used for stormwater storage and treatment if excavation will not adversely affect the wetland's function and values. Uses "Guidance for Evaluating Urban Storm water and Snowmelt Runoff Impacts to Wetlands". *(Rule F.3.(c))*
MITIGATION OF FUNCTIONS AND VALUES					
No specific language addressing this issue.	No specific language addressing this issue.	Alterations cannot reduce the existing storage volume in the immediate watershed. *(Rule Sect.X.Subd.5.D.)*	Requires replacement of all functions and values based on a wetland assessment. *(WMP Sect.3.4.)*	Alterations cannot reduce the existing storage volume in the immediate watershed. *(Rule Sect.IX.Subd.4. A.D.)*	For wetland alterations not regulated by WCA, requires functions and values diminished to be replaced at a one-to-one ratio. *(Rule F.3.(e).)*
PRETREATMENT OF STORMWATER					
Proposed land-altering activity will not "at the downgradient property boundary, increase the site loading of total suspended	Class I Protection Lakes – Designed discharge into a District-designated Protection Lake or associated lateral conveyor	For wetlands that fall within the *Protect* or *Manage I* category, allowed to discharge stormwater with	Depending upon wetland management classification, required to construct a permanent dual purpose (PDPB) or wet detention	The required amount of treatment that stormwater runoff needs to receive prior to its discharge into a wetland is listed in Section	Wetlands may be used for stormwater storage and treatment only if applicant demonstrates that the excavation will not

TABLE 6.

COMPARISON OF WETLAND MANAGEMENT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
solids, total nitrogen or heavy metals, or contribute to a stormwater phosphorous concentration that exceeds the inflow concentration" which ranges from 170 to 250 ppb. *(Rule 2.4.(c))*	shall exhibit a 10% reduction in annual phosphorous loading (lbs/yr) from existing conditions; Class II Improvement Lakes – shall exhibit a 25% reduction in annual phosphorous loading (lbs/yr) from existing conditions. Class III Management Lakes – shall exhibit a no-net-increase in annual phosphorous loading (lbs/yr) from existing conditions. *(WMP Sect. IV.F.2.(a))*	phosphorous loads that are 75% greater than predevelopment loads. For wetlands that fall within the *Manage 2* or *Urban Management* category, allowed to discharge stormwater that meets predevelopment concentrations. *(WMP Sect.VI.Subd.3.)*	basin (WDB). Water quality requirements for PDPB are total suspended solids (TSS) removal of 80% and total phosphorous (TP) removal of 50%. For WDB, TP removal of 55% and TSS removal of 85%. *(WMP Sect.3.4.)*	3.2.5 of the WMP. Design considerations for on-site detention basins include: Permanent pool volume below the principal spillway (normal outlet) shall be ≥ to the runoff from a 1.0-inch 24-hour storm over the entire contributing drainage area assuming full development. Permanent pool avg. depth (basin volume/basin area) shall be ≥ 4 feet, with max depth of ≤ 10 feet. Emergency spillway adequate to control the 100-year frequency critical duration rainfall or runoff event. Basin side slopes above the NWL no steeper than 3:1. Basin shelf minimum width of 10 feet and 1 foot deep below the NWL. To prevent short-circuiting, distance between the major inlets and normal outlet shall be maximized. Sufficient flood pool (live storage) volume above the principal spillway shall be	adversely affect the function and value of the wetland, and will not substantially increase sediment load, tributary area, or water level fluctuations. *(Rule F.3.(c).)*

TABLE 6. COMPARISON OF WETLAND MANAGEMENT STANDARDS					
BCWD	**CMWD**	**SWWD**	**RWMWD**	**VBWD**	**RCWD**
				provided so that the peak discharge from the 100-year frequency, critical duration storm is not greater than the peak discharge for a similar storm and predevelopment watershed conditions. An extended detention of runoff from the more frequent (1-year to 5-year) storms shall detain the runoff hydrograph at least 24 hours and shall be achieved through a principal spillway design which shall include a perforated vertical riser, a small orifice or a multi-stage outlet. Effective energy dissipation devices which reduce outlet velocities to 4 fps. Skimming devices shall be placed on the outlet to 8provide treatment up to the critical duration 5-year storm event. Waterborne sediment shall be prevented from leaving the site during and after construction. Runoff Water Management	

TABLE 6.

COMPARISON OF WETLAND MANAGEMENT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
				Plans prepared under this Rule shall be in conformance with approved municipal water management plans. *(WMP Sect. 3.2.5)*	
BUFFER SIZE AND RESTRICTIONS WITHIN BUFFER					
Requires wetland buffer zones which range from 25 to 100 feet depending upon the wetland susceptibility type. *(Rule 4.3)* *Buffer resolution…* Certain activities are prohibited in buffers depending upon the zone (streamside, middle or outer): (a) creating impervious cover, (b) excavating or placing fill or debris, (c) altering vegetation, except for (i) vegetative enhancements and (ii) removal of invasive exotic species or of trees for disease control or vegetation, (d) applying phosphorous-containing fertilizers and (e) locating roads or utilities.	Require new development and major redevelopment to provide around all wetlands a buffer strip consisting of native vegetation, which at a minimum is consistent with local ordinances, rules and regulations. *(WMP Sect. IV. Subd. E.4.14)* Minimum buffer width/depth, measured from the OHW inland varies from 25 to 75 feet depending upon the Wetland Management Classification. *(WMP Sect. IV. Subd. F.7.)*	For unavoidable wetland impacts to District high priority wetlands, the associated buffer impact must also be mitigated or created in addition to the wetland mitigation. *(Rule Sect.X.Subd.5.H.)* No grading activities or clearing allowed within the buffer zone unless to replace undesirable species: 0-100’ buffer depending upon Wetland Management Classification. *(WMP Sect.VI.Subd.3.)*	Recommends 0 to 100 foot buffer widths for each wetland management category. *(WMP Sect. 3.4)*	A minimum of 16.5-foot buffer around the delineated wetland boundary or the OHW, whichever is greater in elevation, shall be provided for all permitted activities. *(Rule Sect.IX.Subd.4.J.)*	No specific language addressing this issue.

TABLE 6. COMPARISON OF WETLAND MANAGEMENT STANDARDS					
BCWD	**CMWD**	**SWWD**	**RWMWD**	**VBWD**	**RCWD**
BOUNCE AND DURATION OF INUNDATION					
Will not increase the bounce in water level or duration of inundation, during a precipitation event of critical duration with a return frequency of 1.5, 10, or 100 years in the subwatershed drainage area in which the site is located, for any downstream lake or wetland beyond the limit specified in Appendix 2.3 for the lake or wetland susceptibility class. *(Rule 2.4 (d)).*	No specific language addressing this issue.	No specific language addressing this issue.	Hydroperiod guidelines for wetland management standards address bounce, inundation and run out control. *(WMP Sect. 3.4)*	No specific language addressing this issue.	No specific language addressing this issue.

Floodplain, Shoreland and Streambank Development and Alterations

Authority

A number of parties are responsible for managing floodplain, shoreland and streambank development in the State of Minnesota. The U.S. Army Corps of Engineers regulates floodplain development under the National Environmental Policy Act of 1969, the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. The Department of Natural Resources, under Minnesota. Statutes 103F, requires that all counties and municipalities having shorelands within their jurisdiction adopt rules governing their use (shorelands are defined as (1) land within 1,000 feet from the normal high watermark of a lake, pond, or flowage and (2) land within 300 feet of a river or stream or the landward side of a floodplain delineated by ordinance on the river or stream, whichever is greater). Many watershed districts have adopted floodplain and shoreland management standards under the authority established in Minnesota Statutes 103D.

Key Issues

- There is no consensus on the role of watershed districts in restricting development in landlocked basins to prevent future flooding issues.
- There is a countywide need to implement conservation activities that protect water quality and provide habitat. This need tends to be fulfilled on a single request basis. The natural resource needs should be identified and prioritized on a watershed basis.
- There are many benefits to lakeshore buffers including: preventing erosion by dissipating wave action and reinforcing soil through root structure; improving water quality by intercepting runoff and trapping nutrients/sediments; restoring wildlife habitat; and providing natural beauty.

Recommendations

- Adopt a standard methodology for establishing the 100-year floodplain elevation for landlocked basins based upon the results of the County's current efforts.
- Standardize the activities that require permits and the permit threshold.
- Adopt the State Shoreland Rules by reference.
- Identify the natural overflow elevation for landlocked basins on watershed district maps. These maps would be used to encourage future developers to modify their development plans without adopting separate rules for development in landlocked basins.

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
POLICY STATEMENT					
Shoreline and Streambank Alterations: • Permit alteration only if demonstrated erosion is occurring. • Improvements must comply with accepted engineering principles to prevent erosion. • Preserve and enhance the ecological integrity and natural appearance. *(Rule Sect. 5.1)* Watercourse and Basin Crossings: • Discourage the use of lake beds and beds of water bodies for the placement of roads, highways, and utilities. *(Rule Sect. 6.1*) Floodplain and Drainage Alterations: • Promote the reasonable use of water resources, such that landowner may dispose of surface water only in a manner that does not	Insure the protection of the bed, banks and shore of lakes and streams from improper encroachment for the purpose of preventing pollution and alleviating damage by flood waters. *(Rule Sect. 5.f.*)	• Control floodplain encroachments. • Prevent adverse environmental impact. • Reserve right-of-way for future water management needs. *(Rule Sect. VI. Subd.1.)*	• Deny permits for work in the beds or banks or public waters unless it is in the public interest and consistent with state policy, municipal land development guides and drainage plans, and in conformity of the overall District Plan. *(Rule Sect. I. Subd. 4.)*	• Control floodplain encroachments. • Prevent adverse environmental impact. • Reserve right-of-way for future water management needs. *(Rule Sect.V. Subd. 1)*	Shoreland: • Promotes adoption of local shoreland ordinances based on the DNR regulations. *(Rule H.1.)* Floodplain Alterations: • Protect the lives and property values of persons occupying the floodplains. • Enhance the floodplains' water resource values. • Promote the living resource values existing in floodplain areas. • Enhance the floodplains' significant cultural values. *(Rule E. 1.)*

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
unreasonably burden downstream landowners. • Preserve existing water storage capacity in the 100yr floodplain of all waterbodies and wetlands to minimize the frequency and severity of high water. • Prohibit development in the 100-year floodplain which will unduly restrict flood flows or aggravate known high water problems. *(Rule Sect. 7.1.)*					
PERMITTED ACTIVITIES					
Permit required to: • Construct or install a shoreline or streambank improvement below the OHW. *(Rule Sect. 5.2.)* • Place roads, highways and utilities within the beds of any waterbody. *(Rule Sect. 6.2.)* • Alter, fill below the 100-yr flood elevation	Permit required for: • Proposed change to the bed, banks or shores of natural drainageways, lakes, or marshes. *(Rule Sect.7.a.)* • Excavations, grading or filling near any drainageway, lake or marsh. *(Rule Sect. 7.c.)* • Any artificial drainageway across a	Permit required for: • Works within the waters and floodplains of the District. *(Rule Sect. VI. Subd.2.B.)*	Permit required for: • Construction within the flood plains of the District. *(Rule Subd. 2.A.1.)*	Permit required for: • Works within the waters and floodplains of the District. *(Rule Sect. V. Subd. 2.)*	Permit required for: • Constructing, improving, repairing, altering the hydraulic characteristics of a bridge profile control or culvert structure. *(Rule G.2.)* • Development, grading or filling within the shoreland zone, in cities that have not adopted state-approved shoreland ordinances.

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
of any wetland, public water, or landlocked subwatershed or artificially remove surface water from the upper land and across lower land, or obstruct the natural flow of surface water. *(Rule Sect. 7.2.)*	subwatershed, thereby delivering water into another subwatershed. *(Rule Sect. 5.a.)* • Diverting water to or casting water by any artificial means into any legal drainage system from any land not assessed to said drainage system. *(Rule Sect. 5.b.)* • Construction, improve mentor maintenance of private drainage system draining an area in excess of 1 ac., or repair or alteration of any legal drainage system. *(Rule Sect. 5.c.)* • Construction, alteration, repair, or removal of any dike. *(Rule Sect. 5.d.)* • Construction, removal or abandoning any reservoir for the impoundment of water. *(Rule Sect.5.f.)*				*(Rule H.2.)* • Construction, improvement or repair of a public or private drainage system. *(Rule I. 2.)* • Altering or filling land below the 100-yr flood elevation. *(Rule E.2.)*
No specific language addressing this issue.	Any plan for lands abutting any lake or stream shall be approved by the	All subdivisions, plats and developments require District approval, except	All subdivisions, plats and developments require District approval.	All subdivisions, plats and developments require District approval, except	No specific language addressing this issue.

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
	managers. *(Rule Sect. 5.f.)*	within cities with approved local water mgmt plans. *(Rule Sec. VI. Subd.2.A.)*	*(Rule Sect. IV. Subd.1)*	within cities with approved local water mgmt plans. *(Rule Sect. V. Subd.2.)*	
GENERAL STANDARDS					
No specific language addressing this issue.	No specific language addressing this issue.	Refers to policies in the Water Mgmt Plan. *(Rule Sect. VI.Subd.3.C.)*	All improvements within designated shoreland or floodplain areas shall conform to state approved ordinances, or to the District Flood Plain Map and to the State Floodplain and Shoreland Management Standards and Criteria. *(Rule Subd. 2. A.2.)* Alterations will not be allowed in shoreland and floodplain areas that: • Unduly restrict the water-carrying capacity of the channel; or • Adversely affect the ability or efficiency of marshes or adjacent shorelands to prevent or reduce the flow of polluting discharges. *(Rule Subd. 2.A.3.)*	Refers to policies in the Water Mgmt Plan. *(Rule Sect.V. Subd.2)*	No specific language addressing this issue.
SHORELAND STANDARDS					
Criteria for placement of roads, highways, and	Landowners shall remove any trees cut along the	No specific language addressing this issue.	No specific language addressing this issue.	No specific language addressing this issue.	Setback from OHW criteria:

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
utilities within the beds: • Demonstrated public benefit • Retain adequate hydraulic capacity • Retain adequate navigational capacity • Does not adversely affect water quality • Represents the "minimal impact" solution to a specific need with respect to other alternatives *(Rule Sect. 6.3*) Use of bioengineering encouraged as an alternative to traditional engineered stabilization techniques. Criteria: • Structurally stable. • Uses native vegetation in all cases. • Includes a long-term maintenance plan. *(Rule Sect 5.3.)* Rip Rap Criteria: • Not placed more than 5' waterward of the OHW. • Materials should be durable, natural stone and of a gradation that	banks to prevent obstructions. *(Rule Sect. 7.b.)* No wastes shall be disposed of directly or indirectly into a drainageway. *(Rule Sect. 7.b.)*				• Natural environment waters: 200' unsewered, 150' sewered. • Recreational waters: 100' unsewered, 75' sewered. • General development waters: 75' unsewered, 50' sewered. Sanitary facilities setback from OHW: • Natural environment waters: 150'. • Recreational waters: 75'. • General development waters: 50'. Soil absorption systems will not be allowed in: • Low swampy areas or areas subject to recurrent flooding. • Areas where the highest known ground water table, bedrock, or impervious soil conditions are within 4' of the bottom of the system. • Where ground slope creates a danger of seepage of the effluent

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
can withstand ice and wave action. • Finished slope no steeper than 2:1, and preferably no steeper than 3:1 under normal conditions. • Requires a transitional layer at least 6" thick between the rip rap and the shoreline. • Layers at least 1.25 times the maximum stone diameter. • Layer conforms with the natural alignment of the shoreline. • Projects contain a native vegetation planting element equal to or greater than 5% of the overall cost of the project. *(Rule Sect. 5.4.)* Sandblanket Criteria: • Sand and gravel must be clean. • Layer must not exceed 6" in thickness, 50' in width along the shoreline, or one-half the width of the lot, whichever is less, and					on the surface. *(Rule H.3.)*

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
may not extend more than 10 feet waterward of the OHW. • Only one installation per 4 years. • Maintains a natural zone of native shoreline plants of the same depth and equal to 20% of the width of the sandblanket. • Exempts beaches operated by govt entities from the frequency and width restrictions. *(Rule Sect. 5.7.)* Streambank Stabilization Criteria: • Emphasis placed on the structural stability of the project rather than aesthetics, cost, or convenience. *(Rule Sect. 5.9)*					
FLOODPLAIN STANDARDS					
Floodplain or Drainage Alteration Criteria: • Fill shall not cause a net decrease in flood storage capacity below the projected	Flood Control and Drainage Criteria: • Allows disposal of surface water and creation of natural drainageways if no	Floodplain Alterations Prohibited: • Those not in conformance with the Plan, such as outletting of landlocked areas,	Any structure, construction deposit or excavation made in, on, or over the floodplain shall be constructed so as to retain the reasonable and	Floodplain Alterations Prohibited: • Those not in conformance with the Plan. • Alterations which will	Floodplain Alterations not allowed: • Construction of impervious areas within floodplain within the designated

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
100-yr flood elevation. (Calculated by a professional engineer.) • Basement floor elevations of new construction shall be 2' above the 100-yr high water elevation. • For perched water basins, the minimum building elevation is defined as the lowest grade elevation in contact with the structure. • Shall not install a culvert, drainage tile, or other artificial means to remove or drain surface water without demonstrating that adequate passage and no adverse impacts upstream or downstream. • Shall not create an obstruction to the natural flow of surface water without demonstrating that the obstruction will not create adverse impacts upstream or	burden on a landowner with more adverse water-related problems than are reasonable. • Surface water may not be artificially removed from upper land to and across lower land without adequate provision on the lower land for its passage, nor shall the natural flow be obstructed so as to cause an overflow onto the property of others. *(Rule Sect. 5)*	modification of lake outlet elevations, or increasing outlet size and discharge rate. • Alterations which will unnecessarily impact the water resources; • Alterations not in conformance with MN law. *(Rule Sect. VI. Subd. 3. D.)*	necessary water-carrying and discharge capacities of the floodway. *(Rule Subd. 2.A.5*) Flood Control and Freeboard Criteria for Roadways and Buildings located in Tables 5-2 and 5-3 of WMP. *(WMP Sect. 5 page 21)* Normal standard is 2 feet above the 100-year flood elevation.	unnecessarily impact the water resources; • Alterations not in conformance with MN law. *(Rule Sect. V. Subd. 3.D.)*	groundwater recharge areas for the Prairie du Chien-Jordan except for roads, trails, and other recreational improvements. • Site development which involves outside storage of soluble, toxic, or buoyant materials. In Sector A areas, encroachment may occur if: • Floodplain storage volume after encroachment is equal to or greater than the floodplain storage volume prior to encroachment; • The encroachment does not lie with the floodway and does not result in a violation of the District's Wetland Alteration Rule F; • Construction or development subject to flood damage will have a minimum floor elevation of 2' above the 100-yr flood profile; and

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
downstream. *(Rule Sect. 7.3.)*					• Any structures, facilities or embankments within the floodplain will be capable of passing the 100-yr flood without increasing the elevation of the 100-yr flood profile or creating excessive velocities as determined by the district engineer. In Sector B areas, encroachment may occur if: • the encroachment lies within the floodway fringe area of the 100-yr floodplain in those areas where floodway has been identified or in the absence of an established floodway, compensatory storage is excavated; • the encroachment does not result in increasing the 100-yr flood profile within the floodway portion of the floodplain by more than .5' or create velocities exceeding

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
					2.5'/second; • the encroachment does not violate the principle of "equal encroachment"; • the encroachment does not result in violation of the District's Wetland Alteration Rule F; and • structures and facilities subject to flood damage built with the 100-yr flood will have 2' of freeboard between the lowest floor and the 100-yr flood profile. *(Rule E. 3.)*
No specific language addressing this issue	Alterations: • Any excavations, grading or filling near any drainageway, lake or marsh shall be done so as to minimize any detrimental effect to them. • Disturbed areas must be seeded and mulched within 14 days. • Erosion and sediment control measures must be installed prior to	No specific language addressing this issue.	No specific language addressing this issue.	No specific language addressing this issue.	Drainage easements are required over floodplain areas inundated during the 100-yr flood and drainage easements within 100' from the centerline of Rice Creek, Hardwood Creek, Clearwater Creek, and Ramsey County Ditch #2, within 50' of the centerline of cty and judicial ditches, or within 25'of the centerline of any major drainageway of the District.

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
	alteration and maintained until turf is established. *(Rule Sect. 7.c.)*				*(Rule E. 4.)*
No specific language addressing this issue	No specific language addressing this issue	Flood Level Determination assumes: • Ultimate development of tributary watershed; • Design criteria for the 2,10, 100-yr storm; • Type II storm distribution and 100-yr 10-day snowmelt to be modeled; • 100-year event shall either be the 24-hr or 10-day event, whichever is greater. *(Rule Sect. VI. Subd.3.A.)* Minimum building elevations shall be at least 2' above the 100-yr flood elevation or one foot above the emergency overflow of the basin, whichever is greater. *(Rule Sect. VI. Subd.3.B.)* Floodplains adjacent to existing and future waters and waterways shall be preserved by dedication and/or perpetual easement to	No specific language addressing this issue	Flood Level Determination assumes: • Ultimate development of tributary watershed; • Design criteria for the 2,10, 100-yr storm; • Type II storm distribution and 100-yr 10-day snowmelt to be modeled; • In addition, see landlocked section of this rule for VBWD's simplified method for calculating the 100-year flood level. *(Rule Sect. V. Subd. 3.A.)* Minimum building elevations shall be 2'above the 100-yr flood levels. *(Rule Sect. V. Subd. 3.B.)* Floodplain Preservation: Floodplains adjacent to existing and future waters and waterways shall be preserved by dedication and/or perpetual easement to the community, to	No specific language addressing this issue

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
		the community, to include the area lying below 1'above the 100-yr flood elevation. *(Rule Sect. VI. Subd.3.C.1.)* Filling and crossing of water resources: • In lakes, ponds, and other areas of runoff storage, fill and mitigation shall be done so that the 100-yr flood level will not be raised. • In waterways, fill and other alterations shall be limited so that the cumulative effect of all possible alterations shall not increase the existing 100-yr flood level more than .5 foot. *(Rule Sect. VI. Subd.3.C.2.)*		include the area lying below 1'above the 100-yr flood elevation. *(Rule Sect.VI.Subd.3.C.1.)* Filling and crossing of water resources: • In lakes, ponds, and storage sites, fill volumes shall be limited so that the 100-yr flood level will not be raised more than .1'. • In waterways, fill and other alterations shall be limited so that the cumulative effect of all possible alterations shall not increase the existing 100-yr flood level more than .5 foot. *(Rule Sect.V. Subd.3.C.)*	
No specific language addressing this issue	No specific language addressing this issue	In areas determined to be in a flood situation, no filling will be allowed until the situation has been corrected. *(Rule Sect. VI. Subd.3.C.3.)*	No specific language addressing this issue	In areas determined to be in a flood situation, no filling will be allowed until the situation has been corrected. *(Rule Sect. V. Subd.3.C.)*	No specific language addressing this issue
No specific language addressing this issue	No specific language addressing this issue	Improvements or stored materials to be permitted only if it can be demonstrated that they: • Will not be significantly	No specific language addressing this issue	Improvements or stored materials permitted only if it can be demonstrated that they; • Will not be	No specific language addressing this issue

TABLE 7.

COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
		damaged by flooding; • Will not unreasonably endanger life or property; or • Will not unreasonably affect the water resource. *(Rule Sect. VI. Subd. 3.C.4.)*		significantly damaged by flooding; • Will not unreasonably endanger life or property; or • Will not unreasonably affect the water resource. *(Rule Sect. Subd. 3.C.4.)*	
LANDLOCKED BASIN STANDARDS					
No specific language addressing this issue.	No specific language addressing this issue.	Requires Managers to review all development plans for water quantity changes. Until a solution is approved for the central draw stormwater mgmt area, the following activities will be prohibited outside the MUSA: • Alterations shall not limit the water storage capacity below the natural overflow elevation; and • No outlets from landlocked or semi-landlocked watersheds shall be permitted. *(Rule Sect. VI. Subd. 3.D.)*	Low floor elevation must be a minimum of 5 feet above the critical 100-year flood elevation. *(WMP Sect. 5 page 21)*	Flood level analysis should include the effects of seepage and evaporation. Rule lays out a simplified method to calculate this. *(Rule Sect. V. Subd.3.A.)*	If outletting a landlocked basin, provide sufficient dead storage volume to retain back-to-back 100-yr, 24-hr rainfalls and runoff. *(Rule I. 3.)*
STREAM AND LAKE BUFFERS					
Certain activities are prohibited in buffers depending upon the zone (streamside, middle or	No specific language addressing this issue	No specific language addressing this issue	No specific language addressing this issue	No specific language addressing this issue	No specific language addressing this issue

TABLE 7. COMPARISON OF FLOODPLAIN, SHORELAND AND STREAMBANK DEVELOPMENT AND ALTERATION STANDARDS					
BCWD	**CMWD**	**SWWD**	**RWMWD**	**VBWD**	**RCWD**
outer): (a) creating impervious cover, (b) excavating or placing fill or debris, (c) altering vegetation, except for (i) vegetative enhancements and (ii) removal of invasive exotic species or of trees for disease control or vegetation, (d) applying phosphorous-containing fertilizers and (e) locating roads or utilities. *(Rule 4.3)*					

Groundwater Management, Including Sewage Treatment

Authority

The Washington County Groundwater Plan, approved in December 2002, describes groundwater resources and issues, recommends and prioritizes programs and actions, and identifies key state and local organizations (including watershed districts) that should implement those programs and actions.

Many state agencies regulate groundwater, including:

- Department of Health (drinking water and well construction)
- Pollution Control Agency (groundwater pollution)
- Department of Natural Resources (groundwater appropriations)
- Department of Agriculture (agricultural pollution)

Cities operate water supply wells, regulate ISTS, and manage stormwater runoff and infiltration.

Washington County regulates a number of groundwater activities including individual sewage treatment systems (ISTS), drinking water supplies, and groundwater-dependent natural resources. The county regulates the location, design, installation, use and maintenance of septic systems in the majority of the county. The regulations cover sewage flow determination, tanks, distribution system and final treatment and disposal. In 2000, the county implemented a routine maintenance program.

Watershed districts have the authority to further regulate all of these areas, but thus far have been primarily active in surface water. Watershed districts have often been the first to respond to local groundwater resource issues, bringing them to the attention and working with state agencies when further regulation is necessary.

The regulation of groundwater is authorized by the specific watershed district purpose "to provide for the protection of groundwater and regulate its use to preserve it for beneficial purposes" (Minn. Stat. § 103 D. 201 Subd. 2(14)). Watershed districts can be involved with issues and activities within their boundaries that will impact groundwater or surface water resources outside their boundaries, and with issues and activities outside their boundaries that will impact groundwater or surface water resources inside their boundaries. An example of this is Valley Branch Watershed District's involvement with the proposed Woodbury water supply wells located in South Washington Watershed District, as described below.

Key Issues

- *Groundwater contamination and drinking water*: A plume of contaminants appears to be emanating from the area of the Lake Elmo Airport and migrating towards the St. Croix River. This has resulted in groundwater contamination in Baytown Township, the City of Bayport, West Lakeland Township and the City of Lake Elmo, which have identified concentrations of volatile organic compounds (VOC's) in their drinking water supply. More than 130 residential wells have been equipped with treatment systems to remove VOCs. The Minnesota Department of Health has defined a Special Well Advisory Construction Area where special drilling methods and other precautions must be observed.
- *Surface water/groundwater interactions and the impacts to adjacent watersheds and subwatershed:* The City of Woodbury's alternative urban area-wide review (AUAR) for development in the eastern part of the city raised concerns about the impact of appropriating large quantities of groundwater on groundwater elevations and natural resources. The AUAR included plans to install up to 13 new water supply wells near the city's eastern border with Afton. Concern was raised that the proposed

pumping would divert water from Valley Creek, a designated trout stream in Afton and could potentially impact private water supplies.

- *Nitrate contamination:* Individual sewage treatment systems (ISTS) are common in rural and less-densely developed areas of Washington County. ISTS must be regularly maintained. A failed ISTS can lead to wastewater backing up in the system or above ground and groundwater contamination, particularly by nitrate. ISTS are regulated by the county; only a few cities have additional local ordinances. Most soil-based systems have potential for some ground water impacts and require some monitoring. Areas with springs pose a problem in relation to the location of the drain field; it is difficult to know if seepage is effluent or spring water. The county regulates ISTS from a public health perspective while watershed districts could address the issue from a natural resource protection perspective.
- *Groundwater recharge and the need to protect the hydrologic process:* Groundwater recharge can occur nearly everywhere in Washington County except where there is an impermeable surface (roads, roofs), a confining layer, or where groundwater is discharging (some lakes, wetlands, springs, and creeks). Preserving groundwater recharge is important to maintaining groundwater elevations and protecting drinking water supplies and groundwater-dependent natural resources (e.g. fens, springs, spring creeks and some lakes and wetlands).

Recommendations

- Table 8 demonstrates that none of the watershed districts in Washington County have adopted rules or regulations for groundwater management. One of the challenges of the County's Groundwater Plan was to define the role of watershed districts in groundwater management. As the County clarifies this role and as watershed districts gain a better understanding of surface water-groundwater interactions they may want to consider adopting a policy that acknowledges the importance of groundwater and groundwater-surface water interactions and to adopt and enforce specific groundwater regulations, depending on the local issues. For example, a generic groundwater policy may have provided the Brown's Creek Watershed District with the authority to protect a groundwater-dependent fen from development.
- Effective management of surface water resources clearly requires an understanding of groundwater resources. Watershed districts should endeavor to inventory and understand their groundwater and groundwater-dependent resources.
- Adopt standards for the following groundwater management areas: groundwater appropriations, groundwater recharge, and groundwater quality.
- Instead of duplicating efforts, watershed districts should evaluate whether or not the County's ISTS program addresses natural resource protection adequately. If not, the watershed districts may want to consider adopting rules that would provide additional protection to the water resources of the district.
- The group discussed the Valley Branch Watershed District's approach to locating individual sewage treatment systems. Because the VBWD rules require drainage easements up to the 100-year floodplain elevation and the County requires that ISTS not be located within an existing drainage easement, there are no new ISTS within the 100-year floodplain elevation. The group suggested that the County adopt a more straightforward standard requiring future ISTS to be located above the 100-year floodplain elevation of a waterbody.
- The county should become aware of watershed district rules regarding ISTS so that it doesn't inadvertently issue a permit contrary to the watershed district requirements. This is preferable to each watershed district reviewing every application before a permit is issued.
- Watershed districts should work with the county on compliance and enforcement issues related to ISTS.
- The watershed district's resource assessment and prioritization could determine to what extent septic systems are affecting a water body and whether or not greater protection is needed than what is afforded by the county regulations.

TABLE 8.

COMPARISON OF GROUNDWATER MANAGEMENT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
POLICY STATEMENT – GENERAL					
No specific language addressing this issue.	The District shall work with local government units to modify land use and Zoning Plans to protect groundwater and groundwater recharge areas. *(WMP Sect. IV Subd. E.3)* The District shall not allow mining within three feet of the highest indicated groundwater table. *(WMP Sect. IV Subd. E.3)*	Encourage land use practices that consider the groundwater, surface water, and associated natural resources in the decision-making process. *(WMP Sect. III)*	Participate in an intergovernmental committee, including Washington County, to evaluate and guide groundwater management activities. *(WMP Sect. IV)* Develop a shared GIS database including data on District water wells, water use and contamination sources and collaborate on geographic and attribute data management and updating. *(WMP Sect. IV)*	To manage the water resources of the District, the Managers must be informed of the proposed appropriation of ground and/or surface waters. The Managers require that the effect of the proposed appropriation be defined before approval is granted. *(Rule Sect. VII. Subd.1)*	No specific language addressing this issue.
POLICY STATEMENT - WELLHEAD PROTECTION					
No specific language addressing this issue.	No specific language addressing this issue.	Work with all communities and non-community public water supplies systems as they develop and implement their Wellhead Protection plans. *(WMP Sect III Subd. B)*	Assist with development and implementation of the North St. Paul Wellhead Protection Project. *(WMP Sect. IV)*	No specific language addressing this issue.	No specific language addressing this issue.
POLICY STATEMENT – GROUNDWATER RECHARGE AND SURFACE WATER INTERACTIONS					
Identify groundwater recharge and discharge areas by linking surface water and groundwater studies results. *(WMP Sect III-8)*	The District shall require natural infiltration of runoff where practical. *(WMP Sect. IV.E.7.b(4))*	Identity and provide a high level of protection for wetlands and other landscape features that serve as important	Promote increased open spaces and reduction of impervious surfaces to potentially increase groundwater recharge.	No specific language addressing this issue.	Restrict impervious areas within the floodplain in the recharge area of the Prairie du Chien-Jordan aquifer or surficial aquifers.

TABLE 8.

COMPARISON OF GROUNDWATER MANAGEMENT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
It is the policy of the District to: Promote on-site infiltration of stormwater *(Rule 2.1)*	Identify, map, and prioritize, and protect groundwater recharge areas within the District boundaries. *(WMP Sect. IV Subd. E.3)* Requires that all development and improvement which result in one-half acre of impervious surfaces to implement groundwater recharge and infiltration BMPs. *(WMP Sect. IV Subd. E.3)* All water resource management plans adopted by each local government are required to include land use development guidelines for natural groundwater recharge through infiltration of rain. *(WMP Sect. IV Subd. E.3)* Review and permit all development and improvements within 1000 feet of an identified groundwater recharge area that is listed by the District as a sensitive or high priority recharge area.	groundwater recharge areas. *(WMP Sect III Subd. B)* Utilize infiltration to filter stormwater and replenish groundwater to the extent possible without compromising groundwater quality. *(WMP Sect III Subd. B)*	*(WMP Sect. IV)* Cooperate with other agencies in completion of studies evaluating of how surface water management activities affect groundwater resources. *(WMP Sect. IV)*		*(WMP Sect 4)* Enhance the floodplains' water resource values. Water resource values are defined as those characteristics which promote the natural moderation of floods, maintain the streams' water quality, and provide groundwater recharge. *(Rule E)* To manage stormwater and snowmelt runoff and promote natural infiltration: Maximize infiltration and control runoff volume increase.

TABLE 8.

COMPARISON OF GROUNDWATER MANAGEMENT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
	(WMP Sect. IV Subd. E.3)				
POLICY STATEMENT - GROUNDWATER CONTAMINATION					
It is the policy of the District to: Require management of stormwater flow to limit sediment, nutrient and metals concentrations conveyed to ground and surface waters and promote water quality *(Rule 2.1)*	No specific language addressing this issue.	Identify and ensure effective management of areas where groundwater contamination potential is high or where groundwater contamination has already occurred. *(WMP Sect III Subd. B)*	Promote efficient and effective administration of groundwater pollution regulations. *(WMP Sect. IV)*	No specific language addressing this issue.	Protect recharge areas from future sources of contamination. *(WMP Sect 4)*
POLICY STATEMENT - GROUNDWATER PROGRAMS AND PROJECTS					
Participate in the development of a groundwater monitoring plan and subsequent monitoring program. *(WMP Sect III-8)*	Groundwater recharge area identification. *(WMP Sect IV Subd.D.2c)*	Complete an inventory of unused, unsealed wells; feedlots; drywells; injection wells; old solid waste disposal areas; storage tanks; and permitted discharge points using the Potential Contaminant Source Inventory. *(WMP Sect VI Subd. C.3)* Periodically review status of known contamination sites remediation systems. *(WMP Sect VI Subd. C.3)* Establish a monitoring network of existing wells to sample semi-annually. *(WMP Sect VI Subd. C.3)*	Create a Phase II groundwater management strategy and implementation programs. *(WMP Sect. IV)* Collaborate on the development of an education/information program to promote awareness about groundwater resources and groundwater protection. *(WMP Sect. IV)* Continue to operate the District's abandoned well sealing program. *(WMP Sect. IV)* Develop a groundwater flow model for the entire	No specific language addressing this issue.	The District supports the sealing of abandoned wells and will cooperate with other governmental units identifying priority wells for sealing. *(WMP Subd 5 Sect. 11)* The District will seek to promote water conservation by urging municipalities to adopt permanent water conservation rules. *(WMP Subd 5 Sect 11)*

TABLE 8.

COMPARISON OF GROUNDWATER MANAGEMENT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
		Identify surface water bodies that are connected to the water table system. *(WMP Sect VI Subd. C.3)* Evaluate the effects of stormwater infiltration on groundwater flow system. *(WMP Sect VI Subd. C.3)* Inventory sensitive groundwater and surface water resources and establish guidelines to prevent degradation of the resources that might financially impact individual citizens of the watershed in the future. *(WMP Sect III Subd. B)*	District. *(WMP Sect. IV)* Evaluate need and resources for a permanent groundwater quality monitoring program. *(WMP Sect. IV)* When possible and appropriate, cost-share with cities and other jurisdictional entities or obtain grant funds to implement a consistent cost-effective district-wide groundwater strategy that is consistent with the Ramsey and Washington County groundwater management plans and programs. *(WMP Sect. IV)*		
ACTIVITIES REGULATED					
Proposed land-altering activity will not: Increase stormwater flow volume from the site for a 24-hour precipitation event with a return frequency of 1.5 years, excepting the increased flow resulting from impervious cover on five percent of the site possessing average site permeability.	Requires all septic tanks and drain fields that outlet directly or indirectly into the District waters to be constructed and maintained in accordance with the rules and recommendations of the State Board of Health and PCA. *(Rule Sect.5.H.)*	Review and provide approval for water appropriations. *(Rules Sect VIII, Subd. 2)* The following Interim Infiltration Standards will apply to landlocked and semi-landlocked subwatersheds outside of the Metropolitan Urban	No septic tank or other waste disposal facility shall outlet directly or indirectly into any lake, watercourse, or public or private drain. *(Rule Sect.V.Subd.1.(1).*)	To manage the water resources of the District, the Managers require that the effect of the proposed appropriation of ground and/or surface waters. The Managers require that the effect of the proposed appropriation be defined before approval is granted."	Review and comment on groundwater appropriations. *(WMP Subd 5 Sect 11)* Soil absorption systems not allowed in: Low swampy areas or areas subject to recurring flooding Areas where highest

TABLE 8.

COMPARISON OF GROUNDWATER MANAGEMENT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
(Rule 2.4)	The volume of discharge shall be limited to the pre-development discharge volumes for the 2-year and 10-year storm events. *(WMP Sect. IV.F.1.(d))*	Service Area that is adopted as of February 9, 1999 until an infiltration or volume control policy is developed and adopted. Maintain the quality and quantity of runoff to pre-development levels; Stormwater quantity must be limited to pre-development volumes only to be adjusted by the watershed where pre-existing land-use zoning makes minor increases necessary. In all cases, infiltration management techniques shall be used to maximize infiltration. *(Rule Sect. IX Subd. 3.D)*		*(Rule Sect. VII. Subd.1)*	known ground water table, bedrock or impervious soil conditions are within 4' of bottom of system Where ground slope creates a danger of the seepage of the effluent on the surface *(Rule H.3.)* Construction of impervious areas within flood plain areas will not be allowed within the designated groundwater recharge areas for the Prairie du Chien-Jordan formation except for road construction, trails, and other recreational improvements. *(Rule E.3)* Volume control rules include a 2-Step Process Minimize imperviousness; Address the use of BMPs designed to infiltrate the impervious surface runoff from the Mpls-St. Paul median storm (0.34 inches) in seventy-two hours. *(Rule C.3.k)*
POLICY STATEMENT -ISTS					
No specific language	No specific language	Ensure cities adopt state	No specific language	No specific language	No new Individual Sewage

TABLE 8.

COMPARISON OF GROUNDWATER MANAGEMENT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
addressing this issue	addressing this issue	standards (MN Rules Ch 7080) for septic system construction and maintenance. Assist local and state officials in notifying septic system owners and service providers of the April 1, 1996 requirements for all systems to be inspected by a licensed or qualified inspector. *(WMP Sect. VI.C.3)*	addressing this issue	addressing this issue.	Treatment Systems (ISTS) will be allowed in sewered areas including replacement of existing ISTS unless a severe hardship is demonstrated and sewer connections are not practical. Administration and enforcement of these standards is to be conducted by the lgu in accordance with MN Rules Ch. 7080. *(WMP Sect. 5.5)* The RCWD promotes the local adoption of the MPCA individual wastewater treatment system regulations. *(WMP Sect 4)*
WATERSHED DISTRICT ROLE IN ISTS					
No specific language addressing this issue.	No specific language addressing this issue.	No specific language addressing this issue.	Ensure local enforcement of existing local septic system or ordinances that are in conformance with Minnesota Pollution Control Agency (MPCA) 7080 Rules and Metropolitan Council requirements. *(WMP Sect. 4)*	No specific language addressing this issue.	Through the water quality monitoring program, the District will advise the lgu on water quality problems that may be associated with the improper design, location, installation, use and maintenance of ISTS. Enforcement or compliance with the ISTS standards shall be the responsibility of the lgu.

TABLE 8.

COMPARISON OF GROUNDWATER MANAGEMENT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
					lgus will be responsible for the assurance that inspection and maintenance of ISTS are carried out. *(WMP Sect. 5.5)*
REFERENCE TO WASHINGTON COUNTY GROUNDWATER PLAN					
Follow the lead of Washington County on matters concerning the management and regulation of groundwater. *(WMP Sect III-8)*	The District acknowledges the Washington County Groundwater Management Plan, as amended. *(WMP Sect. IV Subd. E.3)*	The SWWD intends to follow the general recommendations given in the draft Washington County Groundwater Management Plan. *(WMP Sect VI Subd. C)*	Work with cities where possible to implement a cost-effective district-wide groundwater strategy that is consistent with the Ramsey and Washington County groundwater management plans and programs. *(WMP Sect. IV)*	No specific language addressing this issue.	No specific language addressing this issue.

Greenways and Open Space

Authority

While the regulation of greenways and open space is not identified as clearly as other JPAWMO authorities, the establishment of greenways and open space is generally authorized by Minnesota Statutes 103B and 103D. Watershed districts have adopted greenways and open space regulations pursuant to one of the following authorities.

According to Minnesota Statutes § 103D.335 Subd. 18, "The Managers may prepare a floodplain map of the lands of the watershed district that are in the floodplain of lakes and watercourses. The map must be made available to the counties and local municipalities for inclusion in floodplain ordinances."

According to Minnesota Statutes § 103D.335 Subd. 19 "The Managers may prepare an open space and greenbelt map of the lands of the watershed district that should be preserved and included in the open space and greenbelt land areas of the watershed district. The map must be made available to the counties and local municipalities for inclusion in floodplain and shoreland ordinances. The managers may control the use and development of land in the floodplain and the greenbelt and open space areas of the watershed district. The managers may adopt, amend, or repeal rules to control encroachments, the changing of land contours, the placement of fill and structures, and the placement of encumbrances or obstructions, and may require a landowner to remove fill, structures, encumbrances, or other obstructions and restore the previously existing land contours and vegetation. The Managers may by rule provide a procedure for the watershed district to do the work required and assess its cost against the affected property as a special assessment. The rules apply in the absence of county or municipal ordinances regulating the items set forth in this subdivision."

Minnesota Statute 103B and Minnesota Rules 8410 identify a number of watershed management charges that a greenways plan could address. For example, Minnesota Rules 8410.0090 H (2) states "the assessment of existing and potential problems as determined by the organization must, at a minimum, include the adequacy of programs to maintain the tangible and intrinsic values of natural storage and retention systems".

The main reasons watershed districts are interested in preserving greenways or open space are:

1. Preserving hydrologic corridors (e.g. floodplains, stream channels, springs and seeps, etc.);
2. Preserving critical habitats;
3. Preservation of hydrologic reserve areas (e.g. groundwater recharge areas);
4. Providing flood protection; and
5. Providing recreational areas.

A number of common techniques/tools for establishing greenbelts and open spaces include:

1. Buying land - A fee title to land is purchased.
2. Conservation easements – Conservation easements pass part of the interest of the property to someone else, usually to prevent the property from being developed. The easement can be donated or purchased.
3. Purchase of development rights – A landowner is paid to permanently give up the right to develop land. When this occurs, a *conservation easement* is placed on the land.
4. Transfer of development rights - The development rights of one parcel are sold to the owner of another parcel, allowing more development on the second piece and preventing or reducing development on the first.

5. Regulation of land alteration - Mechanisms used by agencies to restrict changes in land use, i.e. city zoning, watershed district rules, etc. Conservation overlay is sometimes used to apply more restrictive standards to lands having certain characteristics.
6. Open space development - A development pattern that arranges the layout of buildings in a compact area of the site so as to reserve a portion of the site for community open space or green space that is protected in perpetuity.

Key Issues

- A key issue for watershed districts is how it wants to affect a greenways and open space regulation. Depending upon the goals and objectives of the watershed district, it may be more advantageous to address greenways and open space through the floodplain management ordinances (e.g. the SWWD) or it may be more advantageous to work with the local units of government in the development of an overall land conservation program (e.g. the RCWD and the City of Hugo).
- Watershed districts and JPAWMOs need to determine their role in land use issues. Since watershed districts do not have land use control, they should coordinate land use decisions with the cities which do have land use control. The watershed district could assist communities in developing open space programs, assessing land use choices and choosing the appropriate tools.

Recommendations

- Watershed districts could retrofit existing standards to provide a means such as wetland/buffer standards, floodplain standards, shoreland ordinances and water crossings. to develop greenways and open space in the watershed.
- Purchasing interests in land should be used as a tool to protect the water resources of the district. For example, floodplain management standards could allow the district to acquire areas through conservation easements that would provide flood protection to residents while providing an open space corridor that would maintain the natural hydrology of the system.
- Watershed districts should work with the local units of government to assist them in establishing their own standards/ordinances for land conservation. They should work with the municipalities in a land conservation effort so that the objectives of the watershed district and the communities are understood by both parties and met in the overall land conservation program (e.g. collaborative effort to delineate, map and prioritize potential greenways and open space in the watershed).
- Watershed district rules could contain standards for greenways but should not prescribe land uses. Watershed districts should work with communities to ensure that cities adopt land uses that are consistent with the standards.
- Watershed districts should encourage cities to change the park dedication policy to allow for dedication of passive, as well as active areas, to provide for greenways and open space protection.

TABLE 9.

COMPARISON OF OPEN SPACE AND GREENBELT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
POLICY STATEMENT					
Land-use changes and increasing urbanization have a direct impact on flood protection: it alters the drainage system of the watershed while increasing the amount of runoff generated by a given rainfall event. *(WMP Sect. I-2.5)* Identify groundwater recharge areas in the watershed and develop strategies for protecting/preserving these areas. *(WMP Sect. III-1)*	The District will acquire, if necessary, water flowage easements, access easements, and/or fee title to land adjacent to these bodies of water to resolve current and future problems to the District. *(WMP Sect. IV.E.2.b.2)* The District shall work with Washington County and the Washington Conservation District to identify, map, prioritize and subsequently protect groundwater recharge areas within the District's boundaries. *(WMP Sect. IV.E.3.b(1))* The District shall require the water resource management plans adopted by each local government to include land use development guidelines for natural groundwater recharge through infiltration of rain and for protection of groundwater quality though the control of land use and development.	Coordinate community development of linear greenways to encourage environmental passageways for wildlife and for recreational and aesthetic uses. *(WMP Sect.III-2 Goal 1 Policy F)* Encourage land use practices that consider the groundwater, surface water, and associated natural resources in the decision-making process. *(WMP Sect. III-3 Goal 4 Policy B)* It is in the best interest of the public health, safety and welfare that the Managers regulate the development and the use of floodplains (where floodplain is defined as the area along channels and waterways, including the area around lakes, marshes, lowlands, and ponding areas which would become inundated as the result of a flood occurring on the average	To develop a coordinated land management strategy to protect high value natural resources, corridors and buffers and enhance the biological diversity and landscapes functions. *(WMP Sect. 2)* To improve open space corridor linkages and wildlife habitat where possible. *(WMP Sect.3.5)*	Floodplains adjacent to existing and future waters shall be preserved by dedication and/or perpetual easement to the community in which they are located. These easements shall cover those portions of the property which are adjacent to the water or waterway and which lie below the 100-year floodplain elevation. *(Rule Sect. V. Subd. 3.C.1)*	Enhance the floodplains' significant cultural values, which include preservation of open space, natural beauty, areas for scientific study, outdoor education, and recreation. *(Rule E.1.d)* WMP identifies, as an important water management objective, the preservation of open space and natural wildlife areas which are an essential part of the ecosystem. Policy of the District is to coordinate with the state, counties, and municipalities to enhance their on-going recreational programs which may be affected by water resource management activities. *(WMP Sect. 4)* To evaluate and control development of groundwater recharge areas. Prohibit the construction of impervious surfaces over areas designated as floodplain recharge areas except for

TABLE 9.

COMPARISON OF OPEN SPACE AND GREENBELT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
	(WMP Sect. IV.E.3.4) The District shall work with local government units to modify Land Use and Zoning Plans to protect groundwater and groundwater recharge areas. *(WMP Sect. IV.E.3.6)* The District will require townships and cities to establish minimum 100-foot buffer areas along streams to be acquired as part of land dedication upon development or protection through Washington County Green Corridor Program. The District will work with Washington County and other participating agencies, with regards to parks, natural corridors and open spaces to ensure the improvement and protection of the District's water resources. *(WMP Sect. IV.E.11.b.1)* The District will identify priority areas to be put into	once every 100 years). *(Rule Sect. IV.Subd.1.A.)*			road construction, trails, and other recreational improvements where no alternatives exist. *(WMP Section 4)*

TABLE 9.

COMPARISON OF OPEN SPACE AND GREENBELT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
	conservation easement of protective status for the general purpose of helping meet and maintain long-term resource goals. *(WMP Sect. IV.E.11.b.4)*				
APPLICATION					
Develop a floodplain map of the District for use by local communities. *(WMP IV-1a. Flood Protection c.)* Develop a map of the District which identifies soil types and areas suitable for infiltration and groundwater recharge. *(WMP Sect. IV-1)*	Identify major groundwater recharge areas in the District. *(WMP Sect. III)* Promote natural corridor and/or protective status for Carnelian and Silver Creek. *(WMP Sect. III)*	Central Draw Project and Flood Storage Area Maps. *(Component of upcoming major WMP amendment)* Greenways concept plan which preserves regional areas of interest is identified in the watershed management plan (will result in a Greenway and Natural Features Map). *(WMP Sect. VI)*	Developed a greenways management plan to guide cities in the development of local plans.	No specific language addressing this issue.	No specific language addressing this issue.
ACTIVITES REGULATED					
No person shall alter or fill land below the 100-year flood elevation of any wetland, public water, or landlocked subwatershed without first obtaining a permit from the District, or from the appropriate local government unit in accordance with a state-approved floodplain management ordinance. *(Rule 7.2)*	The District will regulate new development and groundwater recharge area land use through its rules. *(WMP Sect. III)*	Buildings or other improvements to be located in the floodplain will be permitted only when it can be shown that it will not be significantly damaged by flooding, will not unreasonably endanger life or property and will not unreasonable affect the water resource. *(Rule Sect.VI.3.C.4.)*	Prohibits development in floodplains without a permit (Rules) No development in floodplains without replacement of lost storage volume (policy) Wetland buffer protection (policy)	General activities that require a permit include: Land alterations, such as grading or filling, which remove or cover surface vegetation of 1 acre or more; All projects which create a new impervious surface area of 6,000 sq. ft. or more; All work within the waters and floodplain of the	Construction of impervious areas within floodplain areas will not be allowed within the designated groundwater recharge areas for the Prairie Du Chien Jordan formation except for road construction, trails and other recreational improvements. *(Rule E.3.a)*

TABLE 9.

COMPARISON OF OPEN SPACE AND GREENBELT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
				District; All projects which result in a discharge of municipal or industrial water or wastewater to a surface water drainage system; All subdivisions, plats, and developments; All projects which result in lake augmentation; and All projects which result in a wetland impact. *(Rule Sect. I. Subd. 3.)*	To protect water quality and the conveyance of capacity of the floodplain, the District will not permit site development which would involve the outside storage of soluble, toxic, or buoyant materials. Examples of acceptable floodplain uses include open space, golf courses, and parking surfaces located outside of designated recharge areas with less than six inches of flooding occurring over the surface. *(Rule E.3.b)*
METHOD FOR ESTABLISHING OPEN SPACE AND GREENBELTS					
No specific language addressing this issue.	The District will identify priority areas to be put into conservation easement of protective status for the general purpose of helping meet and maintain long-term resource goals. *(WMP Sect. IV.E.11.b.4)*	Floodplains adjacent to existing and future waters and waterways shall be preserved by dedication and/or perpetual easement to the community in which they are located. These easements shall cover those portions of the property which are adjacent to the water or waterway and which lie below one (1) foot above the 100-year flood elevation. The lgu shall be responsible for all	The Greenways Management Plan suggests that cities: Identify non-tax funding methods for acquisition of natural areas (e.g. park dedication fees); Consider using conservation easements to ensure permanent protection for open space lands and natural corridors.	No specific language addressing this issue.	Applicant will provide drainage and flowage/ponding easements over floodplain areas inundated during the 100-year flood and drainage easements within 100 feet from the centerline of Rice Creek, Hardwood Creek, Clearwater Creek, and Ramsey County Ditch #2, within fifty feet of the centerline of county and judicial ditches, or within 25 feet of the centerline of

TABLE 9.

COMPARISON OF OPEN SPACE AND GREENBELT STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
		necessary stormwater maintenance within the drainage easement unless otherwise designated by the Managers for facilities. *(Rule Sect.VISubd.3.C.1).* The SWWD does not intend to interfere with the land use or park planning of the cities, but rather intends to provide information and cooperatively assist cities in identifying and establishing greenway corridors. Greenways can be established though park dedication and conservation easements; through the restoration and preservation of wetland/buffer complexes; and by working with the County to coordinate the County's linear park with the SWWD greenway. *(WMP Sect. VI)* Draft Greenway management Plan.			any major drainage way of the District. *(Rule E.4)*

Water Appropriation

Authority

Minnesota Statutes § 103G.265, Subd. 1 authorizes the Minnesota Department of Natural Resources (MNDNR) to regulate water use. It states that "the commissioner shall develop and manage water resources to assure an adequate supply to meet long-range seasonal requirements for domestic, municipal, industrial, agricultural, fish and wildlife, recreational, power, navigation, and quality control purposes from waters of the state". A water use permit is required from the MNDNR for uses greater than 10,000 gallons per day or 1,000,000 gallons per year. Permits are not required for withdrawing less than 10,000 gallons per day.

The regulatory process starts with the Minnesota Department of Health (MDH) when an applicant seeks a permit for the construction of a water supply well. The MNDNR has a cooperative agreement with the MDH to review the permit before the permit is issued. For wells that do not require an MDH permit (non-drinking water wells including irrigation or construction dewatering wells), the water appropriations permit application goes directly to MNDNR. MNDNR reviews the permit application for conformance with E & C plan, issues a water use permit (if one is required), provides technical review of the water supply plans, manages water use conflicts (if necessary), and manages natural resource issues. The MNDNR solicits comments from the watershed districts, the Soil and Water Conservation District and other local agencies.

Minnesota Statutes § 103 D. 201 Subd. 2(7) authorizes watershed districts "to provide or conserve water supply for domestic, industrial, recreational, agricultural or other public use".

Key Issues

- Surface watersheds and ground watersheds are geographically misaligned. This becomes an issue when something takes place outside of the surface watershed that impacts the underlying groundwater system, ultimately impacting surface water resources in an adjacent watershed. This issue arose during the Woodbury East Alternative Urban Areawide Review (AUAR) when it became apparent that the impact of constructing 13 groundwater supply wells in the AUAR area located in the SWWD would have a negative affect on Valley Creek, a cold-water trout fishery located in the VBWD.
- There is little consensus regarding the role watershed districts or JPAWMOs could play in groundwater appropriations or what could be incorporated into their rules given the fact that permitting authority lies with the Department of Natural Resources.
- Watershed districts could fill the permitting gap by requiring a permit for wells that supply under 10,000 gallons per day.
- For Washington County to adopt more restrictive standards that the state, (e.g. prohibiting the drilling of wells in the Franconia aquifer) the state would have to delegate all permitting authority to the county.
- There is a perception that data documenting the surface/groundwater interaction as well as quantifying the amount of water pumped from the groundwater system is lacking. This may, however, be more an issue of coordination that one of scarcity since a number of organizations collect groundwater data in Washington County including:
  - Washington County (Example: Nitrate testing in drinking water, North Washington County Groundwater Study)
  - Pollution Control Agency (Example: Groundwater monitoring at the Washington County Landfill Superfund site)
  - Department of Natural Resources (Example: Observation well program)

- Department of Agriculture (Example: Testing for pesticides in groundwater)
- Department of Health (Example: Wellhead protection modeling)
- Washington Conservation District (Example: Staff gauge and monitoring well water level elevations)
- Watershed Districts (Example: South Washington Watershed District infiltration monitoring, Rice Creek Watershed District groundwater level monitoring near Hardwood Creek and Valley Branch Watershed District)
- US Geological Survey (Example: Regional study of aquifer recharge)
- University of Minnesota/Minnesota Geological Survey (Example: Washington County Geologic Atlas, County Well Index)
- Science Museum of Minnesota, St. Croix Watershed Research Station (Example: Groundwater and surface water monitoring near Valley Creek)
- Metropolitan Council (Example: Regional studies to determine long-term feasibility of ISTS)
- Private companies (Example: Gravel mining resource investigations, monitoring of pollution sites)

Except for data produced by private companies, most of this data is publicly available. Distribution of the data varies considerably between organizations. Some is readily available electronically from internet sites, while some is distributed only as paper copies on an "as requested" basis. Groundwater resource management would be facilitated and improved by making more of this data readily available in electronic formats.

Recommendations

- Each watershed district could adopt a rule requiring the watershed district to review MN DNR appropriation permits for wells in or near their watershed. However, watershed districts may not have adequate data to substantiate permit reviews. Each watershed should inform MN DNR of its interest and of any groundwater-dependent resources of special concern.
- In the event that a watershed district is proposing to transfer surface water from one watershed to another, the participating watershed districts (that receiving and that transferring) should enter into a cooperative agreement to ensure that all hydrologic and natural resource issues are being addressed.

TABLE 10.

COMPARISON OF WATER APPROPRIATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
POLICY STATEMENT					
No specific language addressing this issue.	No specific language addressing this issue.	To be informed of the proposed appropriation of surface and/or ground water. *(Rule Sect.VIII.Subd.1.A.)*	Waters of the District will not be routed, discharged, dissipated and lost, adjacent to, outside or and along lines of drains, sewer, tile and pipe after their construction. *(Sect.IV.Subd.3.A.)*	To be informed of appropriation of ground and surface water. *(Rule Sect.VII.Subd.1.)*	It is the policy of the Board of Managers to regulate the appropriation of public waters. *(Rule J.1)*
REGULATIONS					
No specific language addressing this issue.	Permits required for: irrigation projects serving over 5 acres; the repair of any public drainage system; and the construction, improvement and repair of any private drain. *(Rule Sect.5. j-k.)* Permit not required for: emergency repairs on a public drainage system, under $500, but the District notification required prior to start of the work. *(Rule Sect.5.j.)*	Copy of DNR permit application must be filed with the District. *(Rule Sect.VIII.Subd.2.A.)* District will take action within 60 days after receipt of complete application. *(Rule Sect.VIII.Subd.2.B)*	No specific language addressing this issue.	Copy of DNR permit application must be filed with the District. District will take action within 50 days. *(Rule Sect.VII.Subd.2.)* Permit required for all projects which result in lake augmentation. *(Rule Sect. I.Subd.3.A.6)*	Permits required to withdraw water from: a public water basin or wetland wholly within Hennepin or Ramsey Counties, which is less than 500 acres in surface area; and a protected watercourse having a drainage area of less than 50 sq miles. *(Rule J.2.)*
STANDARDS					
No specific language addressing this issue.	No specific language addressing this issue.	No specific language addressing this issue.	Requires all excavation and ditches in which drains, sewer, tile and pipe are laid to be sealed in accordance with accepted engineering practices. *(Sect.IV.Subd.3.A.)*	No specific language addressing this issue.	District has an appropriation checklist form. *(Rule J.3.)*

TABLE 10.

COMPARISON OF WATER APPROPRIATION STANDARDS

BCWD	CMWD	SWWD	RWMWD	VBWD	RCWD
No specific language addressing this issue.	No specific language addressing this issue.	Requires that the effect of the proposed appropriation be defined before approval is granted. *(Sect.VIII.Subd.1.B.)*	Requires plans for withdrawal of ground and surface water and the location of the discharge to be filed with the District for review and comment. *(Sect.IV.Subd.3.B.)*	To define the effect of the appropriation before approvals. *(Rule Sect.VII.Subd.1.)*	No specific language addressing this issue.
No specific language addressing this issue.	No specific language addressing this issue.	No specific language addressing this issue.	When lakes or ponds are augmented from ground water, lake augmentation should cease when sufficient storage volume is reached so that ½ inch of surface runoff can be retained within the lake or pond without overflow. *(Sect.IV.Subd.3.C.)*	No specific language addressing this issue.	No specific language addressing this issue.

References

Brown's Creek Watershed District Second Generation Watershed Management Plan. December 2001.

Carnelian-Marine Watershed District 2000 Overall Plan. August 18, 2000.

Watershed Rulemaking Handbook. Minnesota Association of Watershed Districts. 1998.

Ramsey-Washington Metro Watershed District Watershed Management Plan. May 1997.

Report for Water Governance Study, Washington County, Minnesota. May 1999.

Rice Creek Watershed District Water Resource Management Plan. October 1997.

South Washington Watershed District Watershed Management Plan. 1997.

The Center for Watershed Protection Stormwater Managers Resource Center. Model Ordinances for Aquatic Resource Protection: http://www.stormwatercenter.net

Valley Branch Watershed District Water Management Plan. September 1995.

Brown's Creek WD Rule, October 28, 1999

Carnelian-Marine WD Rule, June 21, 1982

Ramsey/Washington Metro WD Rule, February 27, 1976

Rice Creek WD Rule, August 12, 1998

South Washington WD Rule, February 9, 1999

Valley Branch WD Rule, March 14, 1996