

CHAPTER THREE REDUCING PRIORITY POLLUTANTS

This chapter provides a profile of the District’s priority pollutants. Water quality data, programs and standards are discussed in depth. Priority issues examined in this chapter include: conservation buffers, erosion and sediment control, feedlots, individual sewage treatment systems and wastewater discharges.

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PROFILE OF PRIORITY POLLUTANTS

Improving the quality of surface water resources is a major concern of the BCWD. In many areas of the District surface water is being impaired by sediment and nutrients, as well as by biological pollutants, such as bacteria. Sources of these pollutants are generally tied to land usage and associated management. According to the 1989 Minnesota Land Use-Agricultural and Transition Areas Inventory, agricultural land comprises 88.4 percent of the BCWD, much of which is considered to be erosion prone. Another potential source of pollution is from urban and rural developments. Although not as large in composition as agricultural land, urban and rural developments present pollution potential in the form of contaminated stormwater, soil erosion, failing ISTSs and wastewater treatment facilities.

District's Role in Reducing Priority Pollutants

While the BCWD does not have the outright authority to regulate water quality directly, many of its adopted rules and regulations were devised for the purpose of protecting the quality of water resources. By and large, the District believes that these rules and regulations are adequate to promote water quality. Besides rules and regulations, the District, in conjunction with the CROW (since 2001), has conducted water quality monitoring on the Buffalo Creek and its tributaries since 1989. The purpose of this monitoring effort is to further the development of the overall water quality data baseline, monitor the impact of land use changes and to assess the effectiveness of conservation efforts within the District. In the future, it will be imperative for the District to coordinate this monitoring program with its stakeholders, to ensure water quality monitoring efforts are continued.

Water Quality Standards Profile

State Water Quality Management Classifications

The MPCA establishes water quality standards for all waters of the State, both surface and groundwater. These standards are contained in Minnesota Rules Chapter 7050 and have statewide applicability. The MPCA's statutory authority to adopt water quality standards and to classify waters of the State is found in Minnesota Statutes Chapter 115. Water quality standards consist of beneficial uses and the numerical standards needed to protect those uses. The beneficial uses of water include drinking, protection of aquatic life, fishing and recreation, industrial, agriculture and wildlife use. Chapter 7050 is usually revised every three years. The current version became effective on February 12, 2003.

Chapter 7050 classifies all waters for multiple uses. For example, all trout waters are classified as Class 1B, 2A, 3B, 3C, 4A, 4B, 5 or 6 Waters (see definitions on the following page). All wetlands are classified as Class 2D, 3D, 4C, 5 or 6 Waters. All surface waters not specifically listed in Chapter 7050 and not wetlands, which includes most lakes and streams in Minnesota, are classified as Class 2B, 3B, 4A, 4B, 5 or 6 Waters. Since all waters carry multiple use classes, all the water quality standards for each of the classes apply. If more than one use class has standards for the same pollutant, the most stringent standard is used.

Numerical water quality standards are assigned to each class to protect that beneficial use. For surface waters not protected for drinking, most of the applicable standards are associated with Class 2, fisheries and recreation, which generally protects other uses. Chapter 7050 includes a method to develop site-specific criteria to address pollutants for which numerical standards have not been adopted.

Refer to the current version of the rule for the specific water quality standards that apply to the waters of interest. The use classifications are defined below.

- **Class 1 Waters: Domestic Consumption** - The quality of Class 1 Waters of the State shall be suitable for drinking. All groundwaters, and certain specifically designated surface waters are Class 1 Waters. These waters must meet both the primary (maximum contaminant levels) and secondary drinking water standards issued by the EPA.

- **Class 2 Waters: Aquatic Life and Recreation** - The quality of Class 2 Waters shall be suitable for the growth and propagation of a healthy community of aquatic plants and animals and their habitats, and for aquatic recreation of all kinds, including swimming. Fish from Class 2 Waters should be safe for human consumption and aquatic organisms should be safe for consumption by wildlife. Class 2 Waters are further divided into four subclasses listed below.
 - **Class 2A Waters: Trout Waters** - These waters shall be suitable for the maintenance of a healthy community of cold-water fish. The MPCA uses the Department of Natural Resources list of trout lakes and streams to define Class 2A Waters. This class of surface waters is also protected as a source of drinking water.

 - **Class 2B Waters** - These waters shall be suitable for maintenance of a healthy community of cool or warm water sport fish, associated aquatic life and their habitats. Most lakes and streams in the State are Class 2B Waters.
 - **Class 2Bd Waters** - These waters are a subgroup of Class 2B Waters that are protected for drinking.

 - **Class 2C Waters** - Class 2C Waters are usually small streams that provide a more limited habitat for game fish populations. However, with very few exceptions, the same standards that apply to Class 2B Waters also apply to Class 2C Waters.

 - **Class 2D Waters** - These waters are wetlands and they are protected for the propagation and maintenance of a healthy community of aquatic and terrestrial species indigenous to wetlands, and their habitats. Wetlands shall be suitable for boating and other forms of aquatic recreation.

- **Class 3 Waters: Industrial Consumption** - The quality of Class 3 Waters shall be such as to permit their use with or without chemical treatment for most industrial purposes, except food processing.

- **Class 4 Waters: Agricultural and Wildlife** - Class 4 Waters of the State shall be such as to permit their use for irrigation without significant damage or adverse effects upon any crops or vegetation, including truck garden crops; and for use by livestock and wildlife for watering without inhibition or injurious effects. Class 4 wetlands (4C) are also protected for erosion and sediment control, groundwater recharge, low flow augmentation and stormwater retention.

- **Class 5 Waters: Aesthetic Enjoyment and Navigation** - The quality of Class 5 Waters of the State shall be such as to be suitable for aesthetic enjoyment of scenery, to avoid any interference with navigation or damaging effects on property.
- **Class 6 Waters: Other Uses** - The uses to be protected in Class 6 Waters may be under other jurisdictions and in other areas to which the waters of the State are tributary and may include any or all of the above uses, plus any other possible beneficial uses. No numerical standards are associated with the Class 6 use. This classification does not refer to stormwater detention ponds.
- **Class 7 Waters: Limited Resource Value Waters** - The quality of Class 7 Waters of the State shall be such as to protect aesthetic qualities, secondary body contact use, and groundwater for use as a potable water supply. Class 7 Waters do not provide enough water or suitable habitat for aquatic life and aquatic recreation and are not protected for this use.

Table 3A lists the waters within the BCWD that have been assigned an MPCA Water Quality Management Classification. The location of each of the waters is given by township(s), range(s) and section(s).

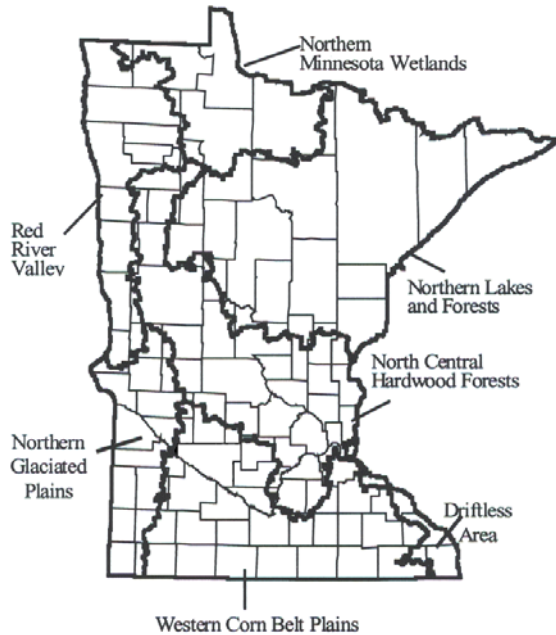
Table 3A
MPCA Water Quality Management Classifications

Name	Classification	Township(s)	Range(s)	Sections (s)
Judicial Ditch No. 15	7	115N	31W	15,16,20,21,29,30
	7	115N	32W	22,25,26,27,28,32,33
County Ditch No. 63	7	116N	30W	19,20,21,28,33
Unnamed Ditch, Glencoe	7	115N	28W	14, 21,22,23,27,28

Ecoregional Classification of Minnesota Lakes

Minnesota has over 12,000 lakes and 92,000 miles of streams spread across a diverse array of environmental conditions. Studies have shown conclusive regional patterns in lake and stream productivity associated with regional differences in geology, vegetation, hydrology and land use. Based on this concept, the EPA established a classification system of Minnesota lakes and streams based upon ecoregions. Figure 3A presents Minnesota’s seven major ecoregions. Notice that the BCWD is found primarily within the Western Cornbelt Plains Ecoregion, which is characterized by rolling to flat terrain and intensive row crop farming.

**Figure 3A
Minnesota's Seven Ecoregions**



Ecoregions were delineated based upon water quality data that was collected on reference lakes and streams statewide. Reference lakes and streams were chosen to represent minimally impacted sites within the region. Criteria used in selecting reference lakes and streams included maximum depth, surface area, fishery classification and general recommendations from the Minnesota DNR. These lakes and streams were also tested for a variety of chemical and physical water quality parameters. Table 3B displays the summer average water quality characteristics for the Western Cornbelt Plains Ecoregion. For additional water quality standards, please contact the MPCA.

**Table 3B
Average Summer Water Quality
Characteristics for the Western Cornbelt Plains Ecoregion**

Parameter		Average Value
Lakes	Total Phosphorus (mg/l)	0.07-0.15
	Chlorophyll a (mg/l)	0.03-0.08
	Secchi Disk (ft.)	1.6-3.3
	Total Kjeldahl Nitrogen (mg/l)	1.3-2.7
Streams	Total Phosphorus (mg/l)	0.16-0.33
	Total Suspended Solids (mg/l)	10.0-61.0
	Turbidity (NTU)	5.2-22.0

Trophic Status

The combination of Secchi disk readings and chlorophyll *a* and total phosphorus levels is often used to define the degree of eutrophication, or trophic status of a lake. The concept of trophic status is based on the fact that changes in nutrient levels (total phosphorus) causes changes in lake clarity (Secchi disk transparency). A trophic state index is a convenient means of quantifying this relationship. One popular index was developed by Dr. Robert Carlson of Kent State University, called the Carlson's Trophic State Index (CTSI). The CTSI uses a log transformation of Secchi disk values as a measure of algal biomass on a scale from 0-110. Each increase of ten units on the scale represents a doubling of algal biomass. Because chlorophyll *a* and total phosphorus are usually closely correlated to Secchi disk measurements, these parameters can also be assigned trophic state index values. Formulas for calculating CTSI values for Secchi disk readings, chlorophyll *a* levels and total phosphorus levels are listed below.

$$\text{CTSI (for Secchi disk readings)} = 60 - 14.41 \ln \text{Secchi disk (meters)}$$

$$\text{CTSI (for chlorophyll } a \text{ levels)} = 9.81 \ln \text{chlorophyll } a \text{ (}\mu\text{g/L)} + 30.6$$

$$\text{CTSI (for total phosphorus)} = 14.42 \ln \text{total phosphorus (}\mu\text{g/L)} + 4.15$$

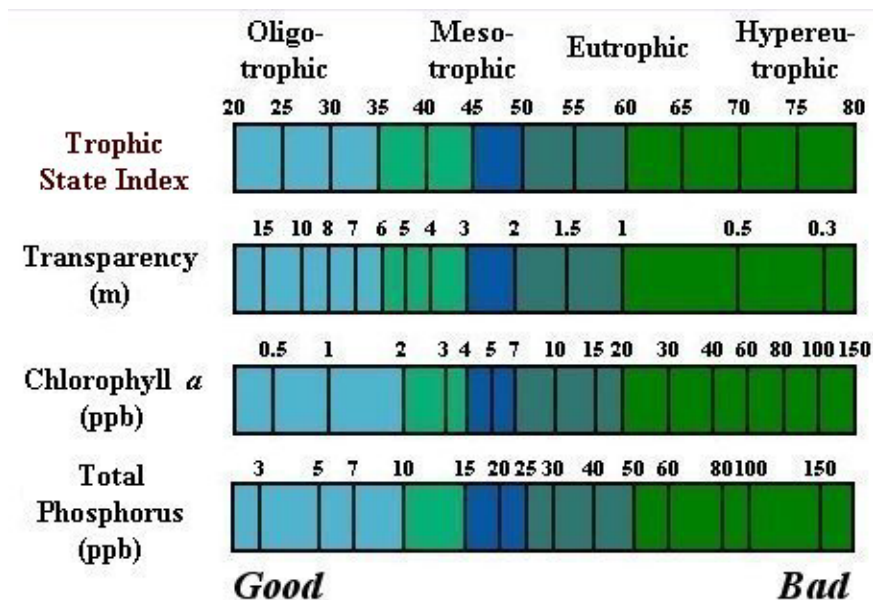
where:

CTSI = Carlson's Trophic State Index

ln = natural logarithm

Figure 3B displays the values that are associated with various trophic levels. Table 3C details mean values for Secchi disk readings, chlorophyll *a* levels, total phosphorus levels and CTSI for MPCA monitored lakes in the District.

Figure 3B
Trophic Levels



**Table 3C
MPCA Water Quality Data**

Lake Name (DNR ID)	Mean Secchi Disk (m)	Mean Chlorophyll <i>a</i> (ppb)	Mean Total Phosphorus (ppb)	Mean CTSI value
Allie (65-0006)	1.3	7.3	204	62
Marion (43-0084)	0.8	53.3	95	68
Preston (65-0002)	1.5	15.5	222	64

Water Quality Data Profile

Total Maximum Daily Loads

The Federal Clean Water Act requires states to adopt water quality standards to protect the nation’s waters. These standards define how much of a pollutant can be in surface and/or groundwater, while still allowing the water to meet its designated uses, such as drinking, fishing, swimming or irrigation. Minnesota’s statewide water quality standards and other provisions that protect water quality are found in Minn. Rules Chapter 7050. Standards are broken down based upon water use classifications.

Section 303 (d) of the Clean Water Act requires States to publish, every two years, an updated list of lakes and streams that are not meeting their designated uses because of excess pollutants. The list, referred to as the Section 303(d) List of Impaired Waters, is based on violations of water quality standards. For each pollutant that causes a waterbody to fail to meet State water quality standards, the Clean Water Act requires the State to conduct a Total Maximum Daily Load (TMDL) study, which identifies all point and nonpoint sources. Water quality sampling and computer modeling determine how much each pollutant source must reduce its contributions to assure the standard is met. Lakes and streams may have several TMDLs, each determining the limit for a different pollutant.

According to Table 3D, three watercourses and one lake in the BCWD are included on the 2002 Section 303(d) List of Impaired Waters. Two watercourses are listed multiple times for different pollutants. The Table also gives the expected start and completion dates for TMDL studies. The absence of a waterbody or watercourse from the List does not necessarily mean that it is meeting its designated uses. It may be that the waterbody or watercourse has either not been sampled or there is not enough data to make an impairment determination.

Table 3D
2002 Section 303 (d) List of
Impaired Waters for the BCWD

Reach	ID	Affect Use	Pollutant	TMDL Study Targeted Start/Completion
Buffalo Creek; Headwaters to JD #15	07010205-502	Aquatic Life	Impaired Biota	2007/2014
Buffalo Creek; Headwaters to JD #15	07010205-502	Aquatic Life	Mercury FCA	2002/2015
Buffalo Creek; JD #15 to South Fk. Crow R.	07010205-501	Aquatic Life	Impaired Biota	2007/2014
Buffalo Creek; JD #15 to South Fk. Crow R.	07010205-501	Aquatic Life	Mercury FCA	2002/2015
JD 15; Headwaters to Buffalo Cr.	07010205-509	Aquatic Life	Impaired Biota	2007/2014
Lake Marion	43-0084	Aquatic Life	Mercury FCA	2002/2015

Funding for the development and implementation of TMDL projects is available through various State and Federal sources. Local units of government, state agencies and soil and water conservation districts that have jurisdiction in the impaired watershed are eligible to enter into a joint powers agreement contract for these funds.

The initial phase, or TMDL development, includes diagnostic work (monitoring, inventory and modeling), an allocation plan, a public process and an implementation plan. To facilitate the development of TMDLs, the MPCA has devised the following 9-step process.

1. Stakeholder Involvement

- Outline water quality problems and answer questions in regional meetings/presentations
- Establish local team (or use existing one) to stay with the project
- Invite local ideas on approaches to solving the problem
- Involve local people in data collection, plan development and review

2. Data Collection

- Use TMDL “grid” or other appropriate format
- Develop source inventories
- Conduct water quality monitoring to identify contributing areas
- Other data – geologic, land use, etc.

3. Analyze and Interpret Data

- Identify sub-watersheds contributing disproportionately to problem
- Estimate “loads” or relative contributions by sector

4. Show Initial Results to Local Team

5. Show High-Loading Watersheds/Sectors

- Discuss broad load-reduction scenarios
- Discuss specific site issues (unsewered communities, unpermitted feedlots, etc.)

6. Run Scenarios

- Run scenarios on different approaches to achieving designated uses

7. Show Scenario Results to Team

- Show scenario results/discuss alternatives

8. Develop Implementation Strategy

- State load-reduction goals by sector
- Describe strategies for reaching goals

9. EPA Review and Approval

- EPA review
- Revisions, if any
- EPA approval

The final step in the TMDL process is to implement the study utilizing existing funding mechanisms, such as Section 319 or other EPA grants, CWP/SRF Phase II funds, challenge grants, NRCS funds, local water plan funds, etc. Some of those programs will give some priority to funding TMDL implementation projects. Local ordinances or regulations, storm water controls and voluntary activities will also contribute to implementation. Successfully implementing a TMDL means the waterbody or watercourse supports its uses, as determined through water quality monitoring. Once water quality standards are met, the final step is to delist the waterbody or watercourse.

In recent years, a number of lawsuits have been filed throughout the nation concerning the development of TMDLs. These lawsuits have been primarily filed by environmental advocates who charge the studies are not being completed as required. The Environmental Protection Agency (EPA) is under court order to establish TMDLs in at least 20 states, if these states do not do so themselves. There is currently no such lawsuit in Minnesota; however, if Minnesota does not comply with Federal requirements to establish TMDLs, a lawsuit and subsequent requirements to complete the studies are likely.

BCWD Monitoring Efforts

From 1989 to 2000, the BCWD routinely sampled seven sites along the Buffalo Creek and its tributaries. Samples were collected and tested for a variety of water quality parameters, including total phosphorus, total nitrogen and total suspended solids. Map 3A displays the location of these sites, as well as flow monitoring sites. The results of past monitoring efforts are given in Figures 3C-3E.

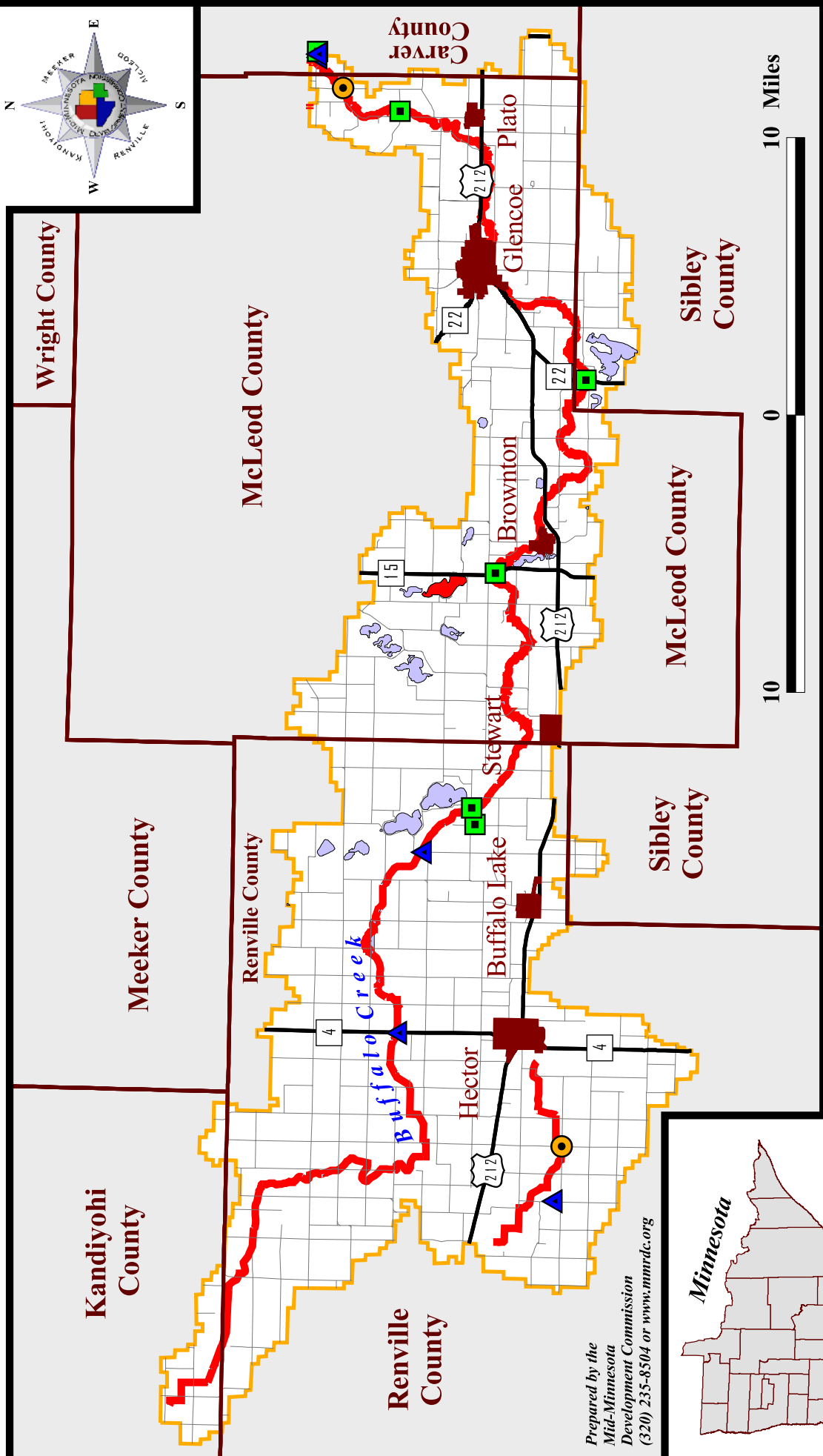
Phosphorus, especially its dissolved form, orthophosphate, is often the limiting factor in the growth of algae and other types of aquatic vegetation. High concentrations of phosphorus can lead to undesirable algal blooms, which can in turn reduce aesthetic appeal and impair biological integrity. Based upon the BCWD's sampling monitoring results, average total phosphorus concentrations are greatest during June and July. During these months, runoff levels are typically high, which is a result of increased precipitation and a moderately established crop canopy.

Total nitrogen is a cumulative measurement of nitrate, nitrite and ammonia concentrations. Together with phosphorus, nitrogen can accelerate eutrophication, causing dramatic increases in aquatic plant growth and a reduction in the ecological stability of surface water. Total nitrogen levels in the District generally exceed mean Western Corn Belt Plains Ecoregion values during May, June and July. These results can be attributed to the high levels of runoff that are normally experienced in the spring and early summer.

Total Suspended Solids (TSS) is a measurement of the suspended matter in water and is often directly related to turbidity levels. TSS can include a wide variety of material, such as soil particles and decaying plant and animal material. High concentrations of suspended solids can cause many problems for stream health and aquatic life. High levels of solids can block light from reaching submerged vegetation, which can reduce photosynthesis levels and eventually dissolved oxygen levels. TSS concentrations within the District are significantly higher than the mean values for the ecoregion. Much like total phosphorus and total nitrogen concentrations, TSS levels peak in the spring and early summer months.

Since 2001, the CROW, as part of their CWP Phase I Diagnostic Study, has taken the lead in water quality monitoring within the BCWD. The CROW is expected to continue to monitor within the District through the completion of their Phase II activities.

Map 3A Buffalo Creek Watershed District Water Monitoring Sites & TMDL Listings



Monitoring Type

- ▲ Water Quality
- Water Quantity
- Quality & Quantity

TMDL Listing

- ▬ TMDL Stream
- TMDL Lake

Watershed District

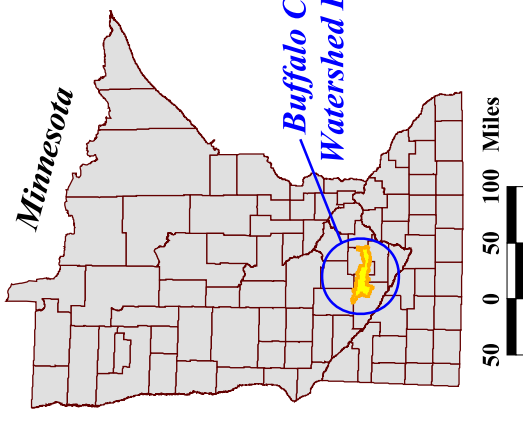
- Watershed District
- Municipality
- County
- Lake
- Major Road
- Minor Road

District Size

- Total Area = 422.1 Square Miles
- Approximate East/West Length = 51 Miles
- North/South Length = 19 Miles

Major Roads

- 212 U.S. Highway 212
- 4 State Highway 4
- 15 State Highway 15
- 22 State Highway 22



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Figure 3C
Buffalo Creek Watershed District
Summary of Total Phosphorus Monitoring (1996-2000)

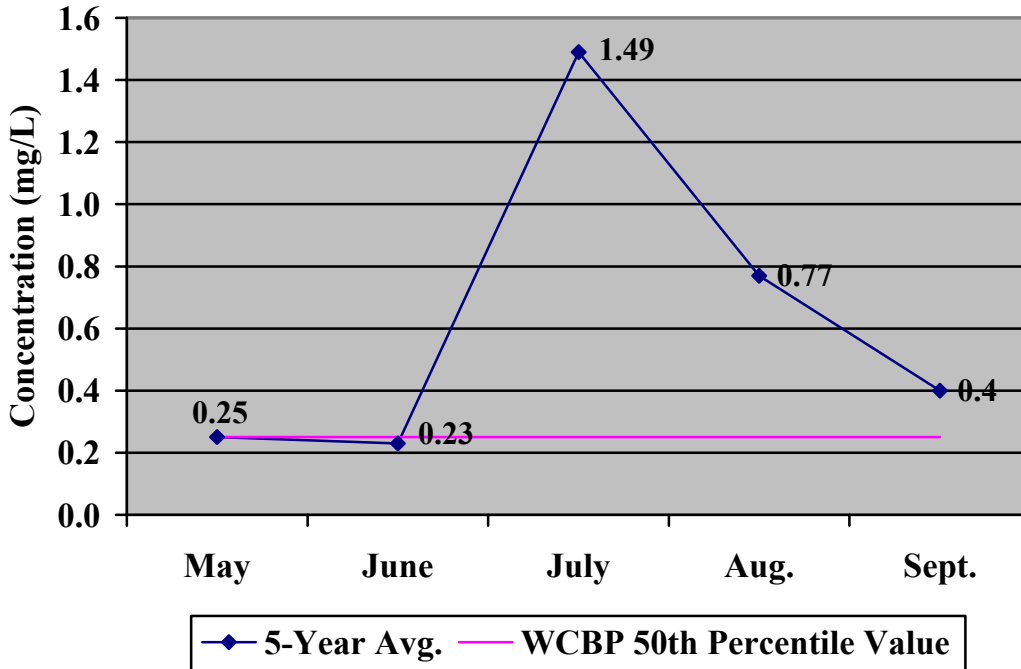


Figure 3D
Buffalo Creek Watershed District
Summary of Total Nitrogen Monitoring (1996-2000)

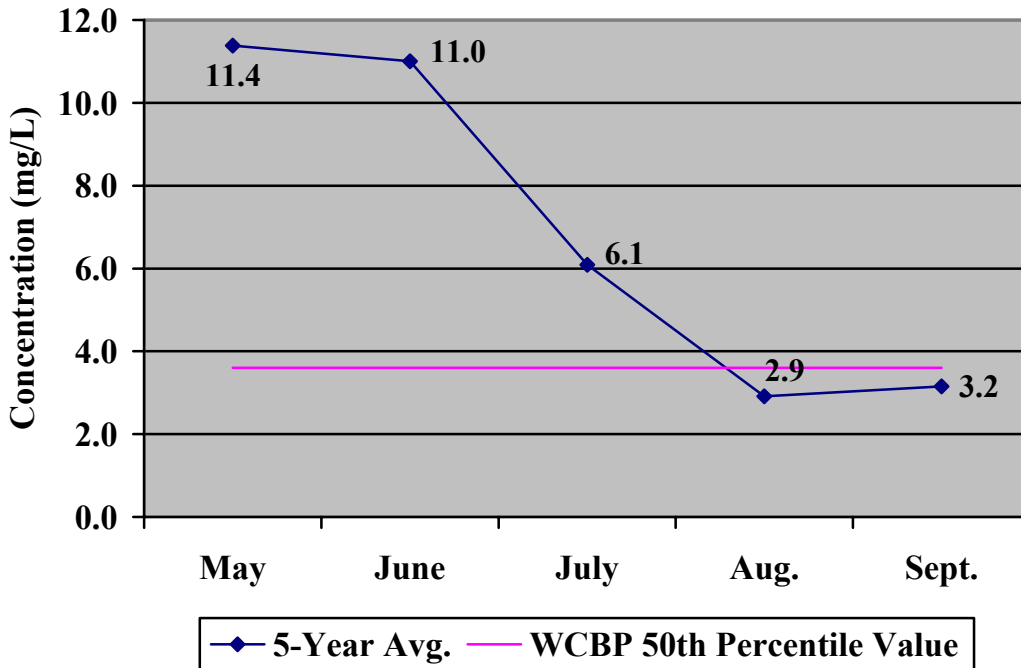
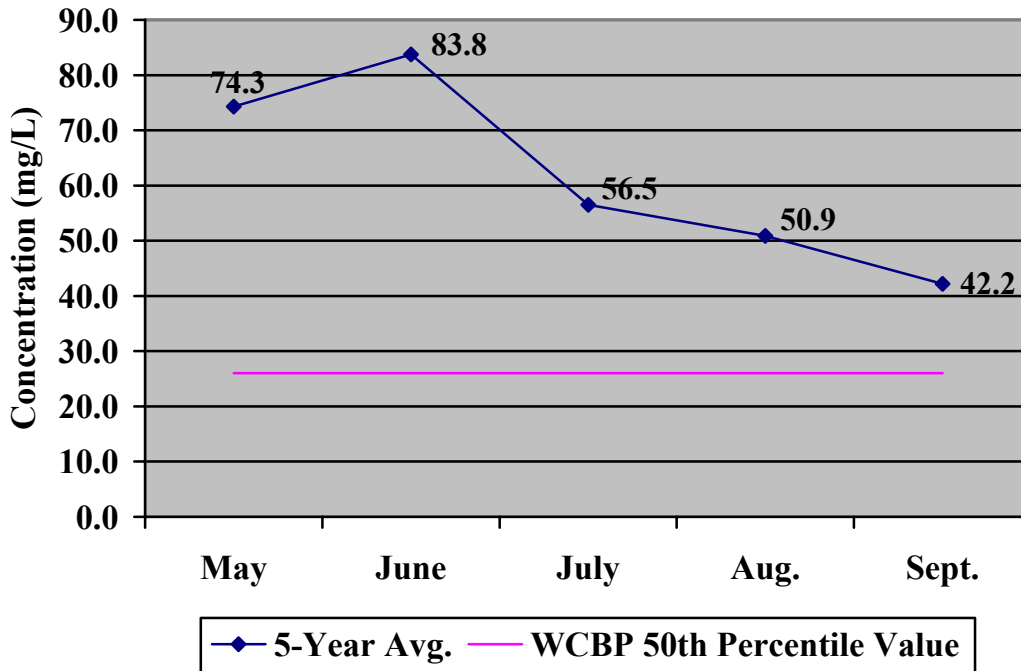


Figure 3E
Buffalo Creek Watershed District
Summary of Total Suspended Solids Monitoring (1996-2000)



Crow River Organization of Water (CROW)

The CROW completed a CWP Phase I Diagnostic Study for the entire Crow River Watershed in 2003. Approximately 28 monitoring sites were established and monitored from 2001 to 2003, including a number within the BCWD. The sites are set up and supervised through a cooperative effort between the CROW, the Minnesota DNR, the MPCA, the North Fork of the Crow River Watershed District and the Buffalo Creek Watershed District. Samples were tested for a number of parameters, including total phosphorus, orthophosphate, ammonia, nitrite, nitrate, total suspended solids and total Kjeldahl nitrogen. A limited number of samples were also tested for biological oxygen demand, fecal coliform bacteria, chloride, alkalinity, hardness, turbidity and chlorophyll a. A Sonde was used to measure pH, dissolved oxygen, temperature and conductivity. Water quality results from the study are contained in Appendix C.

Lake Water Quality Assessment Reports

The Lake Assessment Program (LAP) was developed in 1985 in response to requests from lake associations that were interested in cooperatively assessing the condition of their lakes. Since 1985, the MPCA has conducted over 160 LAP studies. In addition to complete studies, the MPCA conducts a variety of other lake-monitoring efforts that result in briefer reports, such as those listed below.

- **Trend Reports** are often follow-up studies to previously conducted LAP or other studies. Their primary focus is to assess trends in lake condition over time.
- **Note Reports** are brief LAP-like reports often prepared in response to lakeshore residents' concerns or as a part of oral presentations. These reports focus primarily on the current trophic status of the lake.
- **Status Reports** are brief reports that serve to characterize the trophic status and trends of several lakes in a county.

To date, only one LAP report has been conducted in the District. That report was produced for Preston and Allie Lakes in 1997.

Citizen Lake Monitoring Program

The Citizen Lake Monitoring Program (CLMP) is a cooperative program combining the technical resources of the MPCA and volunteer efforts of citizens who collect water quality data on their lakes. CLMP volunteers collect water transparency data using a Secchi disk, which is a eight-inch, circular, all-white metal plate attached to a calibrated rope. This tool is called a Secchi disk. Weekly, during the summer, volunteers collect transparency readings at a designated location. At the end of summer, volunteers send their data to the MPCA to be compiled. Water transparency readings derived through the CLMP are useful in gauging the amount of light penetration into a lake, which is an indirect measure of the amount of suspended materials. In many cases that is an indication of the amount of algae in the water. Transparency monitoring helps scientists detect seasonal trends and signs of degradation. Generally, the sooner water quality problems are detected, the easier and less expensive it is to restore the lake to its previous state.

Lake Allie and Lake Marion have been monitored through the Citizens Lake Monitoring Program. Table 3E lists the average annual Secchi disk readings for each of the lakes. Notice that the transparency of both of the lakes is typical for that of the Western Cornbelt Plains Ecoregion.

**Table 3E
CLMP Lake Transparency**

Lake Name (DNR ID)	Year	Average Secchi Reading (ft.)
Allie (65-0006)	1979	1.3
	1980	3.1
	1981	5.1
	1982	4.7
	1986	5.0
	1987	4.0

Table 3E
CLMP Lake Transparency (*continued...*)

Lake Name (DNR ID)	Year	Average Secchi Reading (ft.)
Allie (65-0006)	1996	3.6
	1997	5.3
Marion (43-0084)	1996	3.0

Citizen Stream Monitoring Program

The Citizen Stream Monitoring Program (CSMP) is a citizens monitoring program for Minnesota’s 92,000 miles of streams. Approximately once a week during the summer, monitors measure transparency, appearance, recreational suitability and stream stage at a designated location on a stream. Monitors also measure precipitation daily

The purpose of the CSMP is to increase the overall understanding of how human activities, such as land use, affect water quality. The goals of the CSMP are to:

1. Help determine the condition of Minnesota’s streams by expanding our water quality monitoring network
2. Provide the opportunity for anyone interested to participate in a basic, centrally administered and interpreted stream monitoring program.
3. Support existing volunteer monitoring programs.
4. Facilitate awareness and understanding of water quality issues.

Changes in transparency, appearance and recreational suitability can serve as yardsticks to measure improvements or declines in water quality. Individuals and organizations can use CSMP data to detect trends in water quality and help decide if additional assessments or actions are needed to protect and improve water quality. Some potential projects for CSMP monitoring are listed below.

- **Change in Upstream Land Use** - If a land management change is planned near a stream or river, a site just downstream of the proposed change could be monitored before and after to detect any effects.
- **Seasonal Storm Monitoring** – CSMP rainfall data could be compared to baseflow (low flow) conditions. Upstream land management practices or crop status should also be recorded.

- **Water Quality Improvement Project** - Monitor a site upstream and a site downstream of a stormwater retention pond or stream vegetative buffer to evaluate its effectiveness at reducing sediment inputs.

Table 3F lists the lone volunteer monitor within the BCWD who registered with the MPCA’s Citizen Stream Monitoring Program. Data displayed was derived from MPCA’s *2002 Report on the Water Quality of Minnesota Streams*.

**Table 3F
2002 CSMP Volunteer and Water Quality Data**

Volunteer	Site ID	Stream Name	Mean Transparency	Minimum Transparency	Maximum Transparency
Gary Schreifels	187	Buffalo Creek	26 cm	9 cm	60 cm

STORET

STORET is a water quality data clearinghouse maintained by the EPA, with assistance from the MPCA. The EPA maintains two STORET data management systems: the Legacy Data Center and STORET.

The Legacy Data Center (LDC) contains historic water quality data dating back to the early part of the 20th century and collected through 1998. STORET contains data collected beginning in 1999, along with older data that has been properly documented and migrated from the LDC. Currently, the new STORET system contains very little information for the District. Table 3G identifies the 18 STORET stations found within the BCWD.

**Table 3G
STORET Stations**

Lake/Stream	ID	Station Location	Agency
Preston	65-0002	3 miles SE of Lakeside	MPCA
Allie	65-0006	4 miles NE of Buffalo Lake	MPCA
Marion	43-0084	3 miles NW of Brownton	MPCA
Buffalo Creek	S000-289	US-212 by Plato	MPCA
Buffalo Creek	S000-457	3.5 miles east of Brownton	MPCA
Buffalo Creek	S000-458	3 miles SE of Brownton	MPCA
Buffalo Creek	S000-459	1.5 miles east of Brownton	MPCA
Buffalo Creek	S000-460	0.5 miles east of Brownton	MPCA

Table 3G
STORET Stations (continued...)

Lake/Stream	ID	Station Location	Agency
Buffalo Creek	S000-461	At CSAH-25, at Brownton	MPCA
Buffalo Creek	S000-462	At CR-54, 4.5 miles NE of Stewart	MPCA
Buffalo Creek	S000-463	3 miles NE of Stewart	MPCA
Buffalo Creek	S000-464	CSAH-7, 2 miles NE of Stewart	MPCA
Buffalo Creek	S000-465	1.5 miles north of Stewart	MPCA
Buffalo Creek	S000-466	1 mile NW of Stewart	MPCA
Buffalo Creek	S000-527	At CSAH-2, at Glencoe	MPCA
Buffalo Creek	S000-528	1 mile SW of Glencoe	MPCA
Tributary to Buffalo Creek	S000-529	3 miles SW of Glencoe	MPCA
Tributary to Buffalo Creek	S000-530	At MN-212, SW of Glencoe	MPCA

Implications and Assessment

Trouble spots for surface water quality are found throughout the District. Table 3D lists the three watercourses and one lake that have been included on the 2002 Section 303(d) List of Impaired Waters. These waters were included on the list because they are not meeting their designated uses as a result of excess pollutants. For each pollutant that causes a surface water to fail to meet its designated use, the Clean Water Act requires a Total Maximum Daily Load (TMDL) study be conducted. A TMDL study identifies all point and nonpoint sources of each pollutant in an impaired watershed. The District should provide in-kind services for the development and implementation of required TMDL studies on impaired waters within the District. In addition, the District should consider applying for Section 319 Program and other TMDL funds for the implementation of best management practices in impaired watersheds.

Additional efforts to diagnose trouble spots within the District are occurring through a Clean Water Partnership Study being conducted by the CROW. Through water quality testing and modeling, the CROW will be able to pinpoint areas where pollution is occurring and provide, in many cases, cost share money to resolve pollution issues. Continued support of the efforts of the CROW will be critical in the effort to improve the quality of water resources within the BCWD.

Reducing Priority Pollutants Issues

Through the planning process, the Overall Plan Taskforce designated a number of priority pollutant related issues as high priority for the BCWD. These issues were so designated because they pose serious threats to the public's health or sensitive resources if they are not addressed, or important opportunities could be lost through inaction. The taskforce recommended that the District individually profile each of these issues in greater detail. Information provided on each

issue include an issue overview, keyplayer(s), the District's role, priority subwatershed(s), implications and assessments, and taskforce recommended initiative(s).

Listed below are the priority issues of this chapter.

- ✓ Conservation Buffers (*Priority Issue 1*)
- ✓ Erosion and Sediment Control (*Priority Issue 2*)
- ✓ Feedlots (*Priority Issue 3*)
- ✓ Individual Sewage Treatment Systems (*Priority Issue 4*)
- ✓ Wastewater Discharges (*Priority Issue 5*)

CONSERVATION BUFFERS

Priority Issue 1

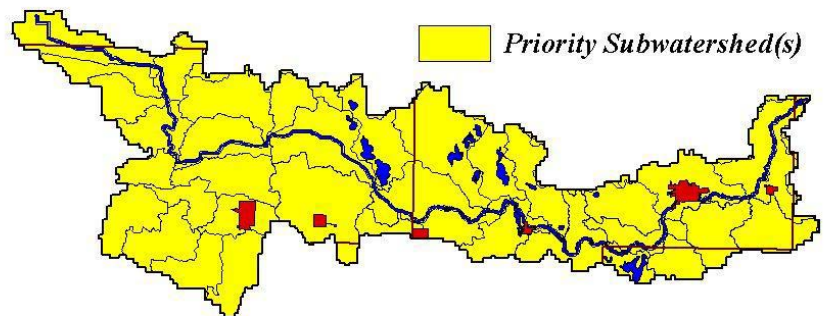
Issue Overview Generally, the Buffalo Creek and its floodplain, from the City of Stewart to the South Fork of the Crow River, remains in its natural state, providing an adequate riparian buffer. West of Stewart, the Buffalo Creek has been channelized and has very little vegetative buffering. The lack of buffers has led to erosion and overall degradation of the Creek's banks. As a priority issue, the Overall Plan Taskforce recommended that the District identify key players and programs associated with conservation buffers.

Key Players BWSR, NRCS, SWCDs

District's Role Nonregulatory – cooperator

Priority Subwatersheds

All subwatersheds



Implications and Assessments

A conservation buffer is an area or strip of land maintained in permanent vegetation to help control pollutants and manage other environmental problems. Examples of conservation buffers include filter strips, riparian buffers, contour buffer strips, field borders, windbreaks, shelterbelts and living snow fences. Whether short term or perpetual, conservation buffers are commonly used to protect water quality, reduce soil erosion and enhance fish and wildlife habitat. If properly installed and maintained, buffers have the capacity to:

- Remove up to 50 percent or more of nutrients and pesticides in runoff.
- Remove up to 60 percent or more of certain pathogens in runoff.
- Remove up to 75 percent or more of sediment in runoff.

Besides the aforementioned benefits, conservation buffers can also be used to reduce noise and odor, reduce flooding, conserve energy, protect buildings, roads and livestock and improve aesthetics.

There is an extensive body of literature that demonstrates the environmental and economic benefits of conservation buffers. In general, most studies recommend a minimum buffer width of 25-30 feet for minimal water quality benefits. For wildlife benefits, buffer widths of 100 to 200 feet are commonly advised, with some studies advocating for buffers over 300 feet.

Conservation Buffer Programs

In April 1997, the USDA launched the new National Conservation Buffer Initiative and pledged to help landowners install 2 million miles of conservation buffers. The Initiative encourages farmers and ranchers to understand the economic and environmental benefits of buffer strips and implement practices through the various programs in the conservation tool kit. These programs include the continuous Conservation Reserve Program (CRP) sign-up, Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentives Program (WHIP), Wetlands Reserve Program (WRP) and Emergency Watershed Protection Program (EWP).

The Initiative is led by the NRCS in cooperation with the Agricultural Research Service, Farm Service Agency; Forest Service; Cooperative State Research, Education, and Extension Service; State conservation agencies; conservation districts; and numerous other public and private partners. To implement the initiative, the NRCS designated an agricultural coordinator to work with the National Corn Growers Association to promote buffers among corn growers and other agricultural groups, as well as appointed a liaison to assist the National Pork Producers Council in promoting the acceptance of conservation buffers as a means of aiding livestock manure management efforts.

Conservation Reserve Program (10-15 Year Contracts)

The Conservation Reserve Program (CRP) offers annual rental payments and cost-share assistance to landowners to establish long-term resource-conserving covers on eligible land. Cover options include grasses, legumes and tree plantings. The goals of the program are to reduce soil erosion, enhance fish and wildlife habitat, improve water quality, protect soil on cropland, demonstrate good land stewardship and improve rural aesthetics.

Under the CRP program, the Commodity Credit Corporation (CCC) makes annual rental payments based on the agriculture rental value of the land and provides cost-share assistance in an amount equal to not more than 50 percent of the participant's costs in establishing approved practices. The durations of contracts are from 10 to 15 years. In return for annual payments, the landowner agrees to implement a conservation plan approved by the local conservation district for converting highly erodible cropland or environmentally sensitive land to a less intensive use (i.e., cropland must be planted with a vegetative cover, such as perennial grasses, legumes, forbs, shrubs, or trees). The cropland must be owned or operated for at least 12 months prior to the close of the annual sign-up period, unless the land was acquired by will or succession or the Farm Service Agency (FSA) determines that ownership was not acquired for the purpose of placing the land in the conservation reserve.

Through the continuous sign-up portion of the CRP program, landowners are given additional flexibility to implement certain high-priority conservation practices on eligible land. Offers to landowners are accepted without a waiting period, provided that eligibility requirements are met. In addition, the following financial incentives are available through the continuous CRP sign-up.

- A signing incentive payment of \$100 to \$150 per acre for riparian buffers, filter strips, grassed waterways, shelterbelts, field windbreaks and living snow fences

- Up to 50 percent cost sharing for practice installation
- A practice incentive payment equal to 40 percent of eligible practice installation costs
- A 20 percent rental rate incentive for riparian buffers, filter strips, grassed waterways and field windbreaks
- A 10 percent rental rate incentive for wellhead protection areas
- Higher annual maintenance payments per acre for certain activities

The CRP program is administered by the FSA, with assistance from the NRCS and local soil and water conservation districts. As of December 31, 2002, the BWSR reported 47,324 acres enrolled in the CRP program within the District's five county region. This total represents 2 percent of the five-county region's total area.

Environmental Quality Incentives Program (1-10 Year Contracts)

The Environmental Quality Incentives Program (EQIP) was reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill) to provide a voluntary conservation program for livestock and agricultural producers that promotes agricultural production and environmental quality as compatible goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land.

The EQIP program offers contracts with a minimum term that ends one year after the implementation of the last scheduled practices and a maximum term of ten years. These contracts provide incentive payments and cost-shares to implement conservation practices. EQIP may cost-share up to 75 percent of the costs of certain conservation practices. Incentive payments may be provided for up to three years to encourage producers to carry out management practices they may not otherwise use. However, limited resource producers and beginning farmers and ranchers may be eligible for cost-shares up to 90 percent. Program measures are carried out according to an environmental quality incentives program plan of operations, developed in conjunction with the landowner, that identifies the appropriate conservation practice or practices to address the resource concerns. Practices identified in the plan are subject to NRCS technical standards and approval through the local SWCD.

Wildlife Habitat Incentives Program (5-10 Year Contracts)

The Farm Security and Rural Investment Act of 2002 reauthorized the Wildlife Habitat Incentives Program (WHIP) as a voluntary program for people who want to develop and improve wildlife habitat. WHIP has proven to be a highly effective and widely accepted program throughout the State. WHIP wildlife habitat targets projects on all lands and aquatic areas, and provides assistance to conservation minded landowners who are unable to meet the specific eligibility requirements of other USDA conservation programs.

Through WHIP, the NRCS provides both technical assistance and up to 75 percent cost-share assistance to establish and improve fish and wildlife habitat. WHIP agreements between NRCS and the landowner generally last from 5 to 10 years from the date the agreement is signed.

Wetland Reserve Program (Perpetual/ Limited Easements)

The Wetland Reserve Program (WRP) is a voluntary program through the USDA to restore and protect wetlands on private property. It provides an opportunity for landowners to receive financial incentives to restore or enhance wetlands on their property. Landowners can enroll in the WRP by one of the following means.

- **Permanent Easement** - USDA will pay the lowest of the following three amounts: (1) the agricultural value of the land, (2) an established payment cap, or (3) an amount offered by the landowner. In addition, the USDA pays 100 percent of the cost of restoring wetlands and seeding of upland areas into native grasses and forbs.
- **30-Year Easement** - USDA will pay 75 percent of the appraised market value for the land and 75 percent of the cost associated with wetland restorations and upland native grass seeding.
- **Restoration Cost-Share Agreement** - USDA will pay 75 percent of the cost of restoring a wetland in exchange for a minimum ten-year agreement to maintain the restoration. No land use payment is provided.

Any type of land that can be restored to a wetland at a reasonable cost is eligible for WRP, except for wetlands drained in violation of Swampbuster or land established to trees under the Conservation Reserve Program. Cost-share is available to restore:

- Wetlands cleared and/or drained for farming, pasture, or timber production;
- Upland areas around a restored wetland and;
- Drained wooded wetlands where hydrology will be restored

The WRP program is administered by the NRCS, with assistance from local soil and water conservation districts. As of December 31, 2002, the BWSR reported 1,116 total acres enrolled in the WRP program in the District's five county area.

Emergency Watershed Protection Program (Contract/Perpetual Easements)

The Emergency Watershed Protection (EWP) program was developed to help protect lives and property threatened by natural disasters such as floods, hurricanes, tornadoes and wildfires. The program is administered by the NRCS, which provides technical and financial assistance to owners, managers and users of public, private, or tribal lands whose watershed area has been damaged by a natural disaster. Each EWP project, with the exception of floodplain easements, requires a sponsor who applies for the assistance. A sponsor can be any legal subdivision of State or local government, including officials of city, county, or State governments, Indian tribes, soil conservation districts, U.S. Forest Service and watershed districts. They determine priorities

for emergency assistance while coordinating work with other Federal and local agencies. Sponsors are needed to provide legal authority to do repair work, obtain necessary permits, contribute funds or in-kind services and maintain the completed emergency measures.

EWP has traditionally provided funding to project sponsors for such work as clearing debris from clogged waterways, restoring vegetation and stabilizing river banks. The NRCS provides up to 75 percent of the funds needed to restore the natural function of a watershed. The community or local sponsor of the work pays the remaining 25 percent, which can be provided by cash or in-kind services. Measures taken need to be environmentally and economically sound and generally benefit more than one property owner.

In 1996, the EWP program was amended to provide for the purchase of floodplain easements as an emergency measure. Floodplain easements restore, protect, maintain and enhance the functions of the floodplain; conserve natural values, including fish and wildlife habitat, water quality, flood water retention, ground water recharge, and open space; reduce long-term Federal disaster assistance; and safeguard lives and property from floods, drought, and the products of erosion. The NRCS may purchase EWP easements on any floodplain lands that have been impaired within the last 12 months or that have a history of repeated flooding (i.e., flooded at least two times during the past 10 years). Purchases are based upon established agency priorities. Under the floodplain easement option, a landowner voluntarily offers to sell a permanent conservation easement that provides the NRCS with the full authority to restore and enhance the floodplain's functions and values. In exchange, a landowner receives the least of one of the three following values as an easement payment.

- A geographic rate established by the NRCS State conservationist;
- A value based on a market appraisal analysis for agricultural uses or assessment for agricultural land; or
- The landowner offer.

The easement provides the NRCS with the authority to restore and enhance the floodplain's functions and values. The NRCS may pay up to 100 percent of the restoration costs. To the extent practicable, the NRCS actively restores the natural features and characteristics of the floodplain through re-creating the topographic diversity, increasing the duration of inundation and saturation and providing for the re-establishment of native vegetation. The NRCS may pay 75 percent of the cost of removing buildings when appropriate.

Reinvest in Minnesota Reserve Program (Perpetual Easement)

The Reinvest in Minnesota (RIM) Reserve Program, administered by local SWCDs and BWSR, was one of the first State programs of its kind in the nation. RIM allows landowners to sell perpetual easements for riparian lands, sensitive groundwater areas, wetland restoration areas (drained wetlands), marginal cropland and land for living snowfences. The payment rate for the program is based on 90 percent of the average market value of tillable land in the township. In addition, RIM Reserve provides cost share funds, often times 100 percent, for the establishment of appropriate conservation and wildlife habitat practices on easement lands.

Since its beginning in 1986, funding for the program has been erratic, ranging from \$51 million to \$3 million. To date, the RIM Reserve has enrolled approximately 3,927 easements, covering 126,567 acres, including 43,401 acres of wetland restoration and adjacent upland. The program has historically fostered partnerships with private organizations, including Pheasants Forever, Ducks Unlimited, Minnesota Waterfowl Association and other government agencies, including the USFWS and the Minnesota DNR.

As of April 2003, the BWSR reported a total of 7 RIM easements, encompassing 250.4 acres, in the BCWD.

References

Board of Water and Soil Resources - www.bwsr.state.mn.us

Center for Watershed Protection - www.cwp.org

Natural Resources Conservation Service - www.mn.nrcs.usda.gov

Taskforce Recommended Initiatives

- ✓ **Policy Guideline:** Best management practices (BMPs) should be encouraged along all waterways and watercourses, with special emphasis on private and public ditches.
- ✓ **Policy Guideline:** The District should annually review the effectiveness of conservation efforts and discuss anticipated future program needs.

EROSION AND SEDIMENT CONTROL

Priority Issue 2

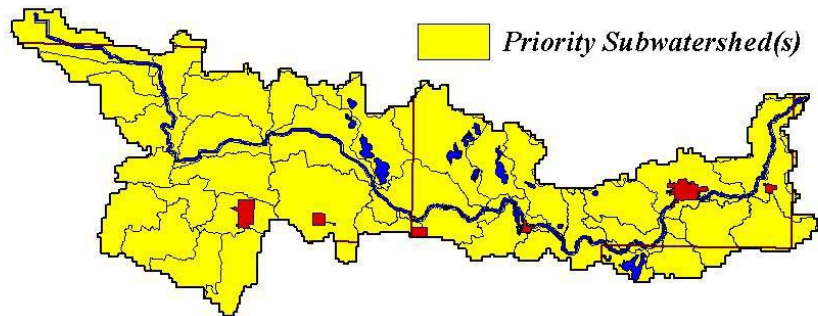
Issue Overview Management of erosion and sedimentation has been an important objective of the BCWD since its creation. With additional growth and development projected to occur in the District, the need for erosion and sediment control will become increasingly important in order to prevent the degradation of water resources. As a priority issue, the Overall Plan Taskforce recommended that the District profile practices that can be used to control various forms of erosion and associated sedimentation.

Key Players BCWD, Cities, Counties, MECA, MPCA

District's Role Regulatory (*Policy Manual, Page 7*)

Priority Subwatersheds

All subwatersheds



Implications and Assessments

Soil erosion and sedimentation are major sources of non-point source (NPS) pollution within the District. Soil particles can potentially carry a wide variety of pollutants into lakes and streams, including: nutrients, pesticides, toxic metals, oils and other contaminants. Water resource impacts associated with erosion and sedimentation include those listed below.

- **Fisheries** – Increased temperature and turbidity of water drives out sensitive fish species. Sediment deposits in stream channels impair gravel beds necessary for the reproduction of many species. Aquatic organisms that are food for fish are also adversely affected. Loss of habitat, reproduction areas and food sources combine to reduce fish populations.
- **Recreation** – Nutrients adhering to sediment often leads to nuisance growth of algae and weeds. The combination of weeds and sediment deposits choke navigable waters and create boating hazards.
- **Health Hazards** – Sediment deposits reduce reservoir storage space and introduce toxins, bacteria and chemicals to water supplies. Increased treatment is needed to bring drinking water into compliance with State and Federal standards. Frequent flooding increases exposure to a variety of health risks associated with contaminants in floodwater or in sediment deposits left after water recedes.

- **Economic** – Taxpayers bear the burden of costs to dredge water channels, to clean clogged storm sewer systems, to repair flood damage and to increase treatment of water supplies. Topsoil loss from agricultural areas reduces productivity of farmland, eventually resulting in increased cost for agricultural products.

Erosion and Sedimentation Control BMPs

Erosion can occur in many forms, including splash, sheet, rill, gully and streambank and streambed. The following section reviews each type and provides examples of BMPs typically implemented to control erosion. Because agricultural land is exempted from the District’s rules and regulations, the following section focuses primarily on construction site erosion and sediment control.

Splash Erosion

Raindrops can impact the ground at velocities up to 20 mph, detaching and suspending soil particles in runoff. On bare ground, that can contribute to nearly 100 tons/acre splashed into the air during a heavy storm. The following are BMPs that are commonly used to control splash erosion.

- Preserve and maintain existing vegetative cover
- Limit soil exposure by phasing construction
- Utilize temporary and permanent cover

Sheet Erosion

When runoff is dispersed over a wide area of disturbed soil, soil is removed in thin layers or sheets. Sheet erosion is the transporting mechanism of soil loosened by raindrops. BMPs used to control sheet erosion include those listed below.

- Reduce runoff volume
- Install sediment trapping devices

Rill Erosion

Depending on slope length and gradient, soil erodibility, rainfall intensity and amount of cover, sheet erosion can concentrate into tiny channels known as “rills”. Road cuts and fills are particularly susceptible to this form of erosion. To control rill erosion, the following BMPs are often implemented.

- Roughen the topsoil
- Stabilize slopes

- Reduce slopes
- Reduce runoff velocity
- Dissipate rills

Gully Erosion

If rills have not been repaired or converted back to sheet flow, runoff can further concentrate and enlarge into gullies. Gully repair can be very time-consuming and costly in terms of labor and machinery. A listing of possible BMPs is provided below.

- Divert concentrated flows
- Stabilize culvert inlets and outlets
- Sediment traps or basins

Streambank and Streambed Erosion

As runoff gains momentum, the discharge into streams can scour and undercut streambanks. Bank erosion adds to suspended material carried downstream from construction sites. Sediment deposits can alter stream channel characteristics and flow patterns. Methods to compensate for these changes are listed below.

- Protection of streambanks and stream beds
- Restoration of streambanks

Sedimentation

Sedimentation occurs wherever water slows down enough to deposit the silt and sediment load from upstream. Installing sediment trapping devices in these strategic areas provides for the maximum reduction of sediment. The following BMPs should be implemented in conjunction with sediment control devices.

- Maintain the sediment control device
- Adapt sediment controls to the site
- Remove sediment from the device, as necessary

Erosion and Sedimentation Control Standards

Presently, the District implements the *Minnesota Construction Site Erosion and Sediment Control Planning Handbook*. While the criteria outlined in this handbook is believed to be adequate to meet the current needs of the District, adaptation may be necessary to address future growth related issues. An additional source of erosion and sediment control criteria that could be reviewed is the *Minnesota Urban Small Sites BMP Manual*, which was developed by the Metropolitan Council. As discussed in chapter two, the manual focuses on runoff management for sites less than five acres and provides information on tools and techniques to assist local governmental units and landowners in guiding development. The manual includes detailed information on several erosion and sediment control BMPs that are designed for small sites in a cold-climate setting.

References

Metropolitan Council – www.metrocouncil.org
Minnesota Erosion Control Association – www.mnerosion.org
Minnesota Pollution Control Agency – www.pca.state.mn.us

Taskforce Recommended Initiatives

- ✓ **Policy Guideline:** Adequate erosion control measures should be incorporated into the designs of all proposed projects.
- ✓ **Policy Guideline:** Erosion should be prevented during and after construction projects and ditch maintenance activities.
- ✓ **Policy Guideline:** All contractors, including “do-it-yourself” projects, should be held accountable for minimizing water runoff and soil erosion.
- ✓ **Policy Guideline:** District residents should be educated on issues related to nutrient and sediment reduction, as well as other sources of nonpoint source pollution.
- ✓ **Policy Guideline:** Support efforts by local units of government in the District to develop, adopt and administer performance standards that protect water resources.
- ✓ **Action Item:** Coordinate the District’s erosion and sediment control criteria with the *Minnesota Urban Small Sites BMP Manual*.

FEEDLOTS *Priority Issue 3*

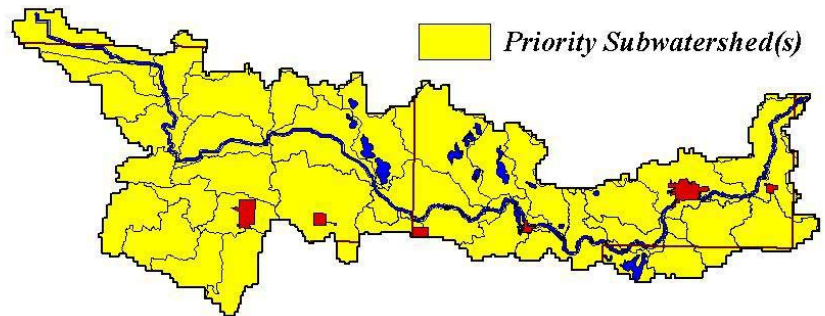
Issue Overview In recent years, each of the counties within the BCWD has become delegated to administer the State feedlot program. While the District is not directly involved in this program, feedlots do pose a potential pollution hazard to the water resources of the District. As a priority issue, the Overall Plan Taskforce recommended that the District examine current State feedlot regulations, as well profile the status of each of the counties in permitting and inspecting feedlots.

Key Players Counties, MPCA

District's Role Nonregulatory – cooperator

Priority Subwatersheds

All subwatersheds



Implications and Assessments

The MPCA regulates and controls pollution created by animal feedlots. The MPCA's feedlot rules were first adopted in 1971 and amended in 1974, 1978 and 2000. The trend in agriculture has been toward fewer but larger livestock and poultry facilities. There has also been an increasing awareness about the potential environmental effects of feedlots.

In accordance with the MPCA's feedlot regulations, the owner(s) of an animal feedlot or manure storage area with 50 or more animal units, or 10 or more animal units if in shoreland (less than 300 feet from a stream or river, or less than 1,000 feet from a lake) needed to register with the MPCA by January 1, 2002. Registration was accomplished through one of three means: 1) the owner(s) provided information on an MPCA registration form and return it to the MPCA or, in a delegated county, the delegated county feedlot officer, 2) the owner(s) submitted a permit application (if required to obtain a permit), or 3) the owner(s) could have been listed on a current (as of October 1, 1997) Level II or Level III inventory that contained the required information and was submitted to the MPCA.

Definition of an animal unit

A standardized measure to compare differences in the production of animal manure for an animal feedlot or manure storage area. A mature cow of about 1000 pounds (455 kg.) is the standard unit.

It is the owner's responsibility to ensure that his or her registration information has been forwarded to the MPCA. Registration information must be updated at least once in every four-year period after January 1, 2002. The MPCA or delegated county will notify owners that they must re-register at least 90 days before their current registration expires. Also, the MPCA or delegated county will send the owner a receipt within 30 days of receiving the registration information from the owner.

Exemptions to registration:

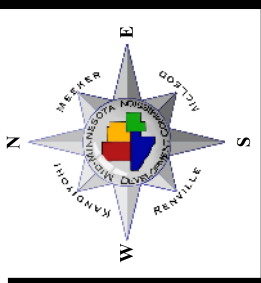
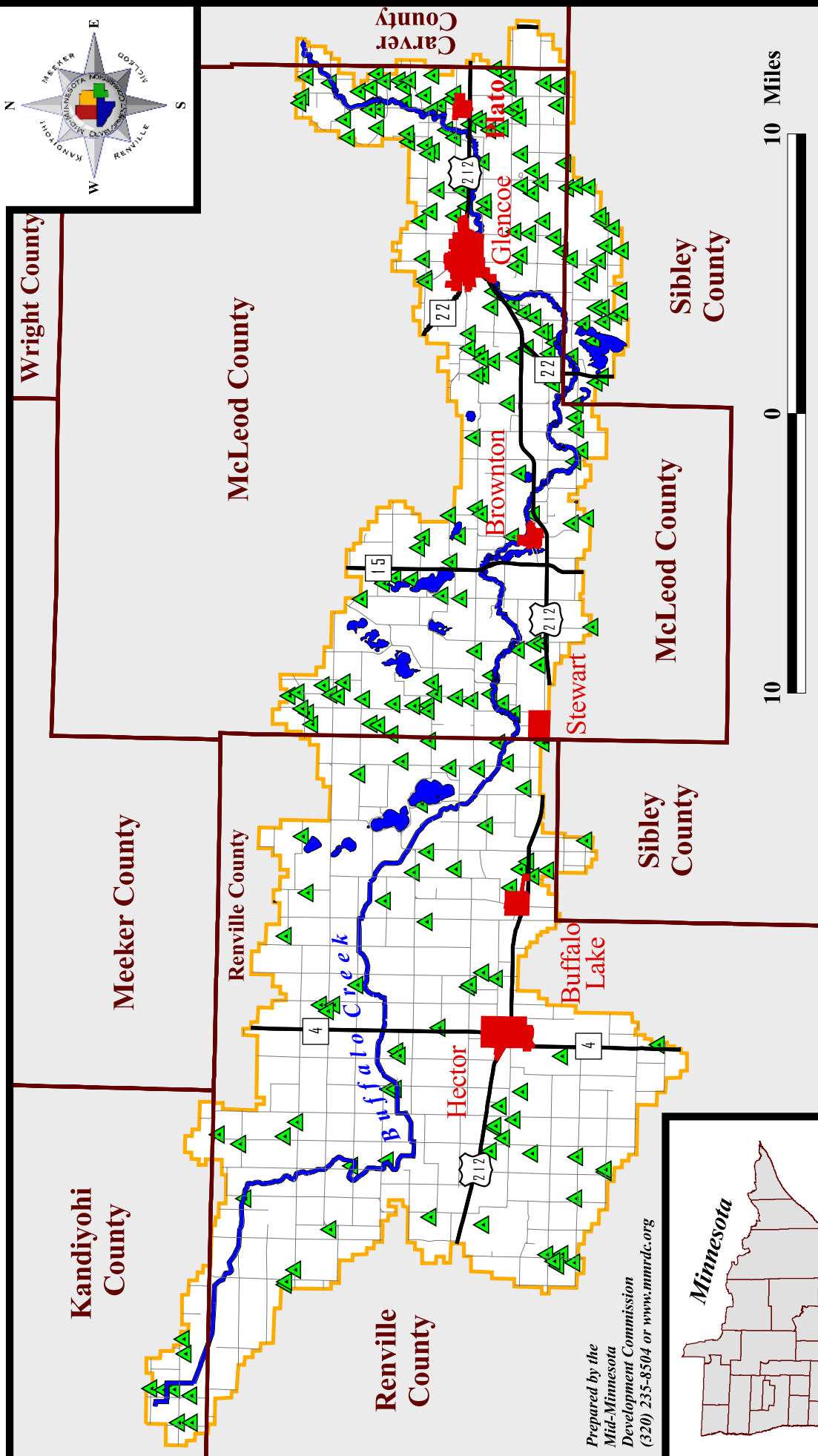
- Owners of livestock facilities located on county fairgrounds were not required to register.
- Owners of pasture or grazing operations that have buildings or lots with a capacity of less than 50 animal units, or less than 10 animal units in shoreland areas, were not required to register.
- Owners of pasture or grazing operations that do not have buildings or open lots were not required to register.

Once registered, owners are directed to obtain any needed permits. The requirement for a feedlot permit is dependant upon the size of the operation and whether a pollution hazard has been identified. Owners with less than 300 animal units are not required to have a permit for the construction of a new facility or expansion of an existing facility if construction is in accordance with the technical standards contained in Minnesota State Rules. For owners with 300 animal units or more, but less than 1,000 animal units, a streamlined short-form construction permit is required for construction activities. An Interim Permit is required for owners with 300 animal units or more, but less than 1,000 animal units, if a pollution hazard has been identified. Finally, a National Pollutant Discharge Elimination System (NPDES) permit or State Disposal System (SDS) permit is required for all feedlots with 1,000 animal units or more. NPDES and SDS permits must be issued by the MPCA, all other permits are to be issued by the county.

Owners of feedlots with less than 300 animal units, with passive manure-contaminated runoff from open lots, are encouraged to sign up for the 2005/2010 Open-lot Agreement. Under this agreement, the MPCA allows the owner to phase in necessary corrections to pollution problems. Owners are required to install clean-water diversions, vegetated buffer areas or filter strips for manure-contaminated runoff, or other corrective measures by October 1, 2005. Owners must next meet the discharge standard of 25 mg/L BOD by October 1, 2010. One way owners can demonstrate compliance with these requirements is through a computer model ("An Evaluation System to Rate Feedlot Pollution Potential," more commonly known as FLEVAL) that achieves a 50 percent or more reduction in phosphorus and biochemical oxygen demand loading.

In an effort to assess the current feedlot related conditions found within each of the District's counties, a questionnaire (Table 3I) was developed and posed to each county's feedlot program contact. Table 3H lists each county's feedlot program contact.

Map 3B Buffalo Creek Watershed District Feedlots



Level II Feedlot

Note: Carver County did not submit the GIS files of their feedlot inventory

Major Roads

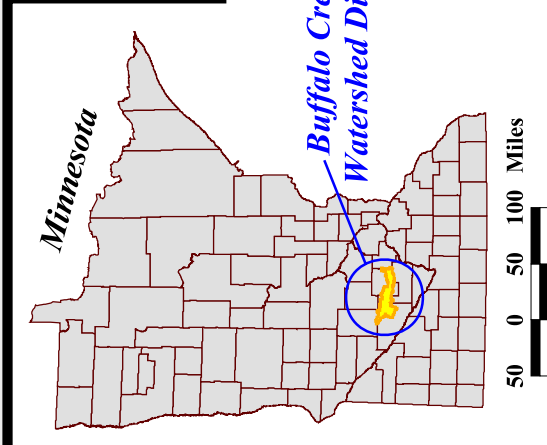
- 212 U.S. Highway 212
- 4 State Highway 4
- 15 State Highway 15
- 22 State Highway 22

Watershed District

- Municipality
- County
- Lake
- Buffalo Creek
- Major Road
- Minor Road

District Size

- Total Area = 422.1 Square Miles
- Approximate East/West Length = 51 Miles
- Approximate North/South Length = 19 Miles



Prepared by the
Mid-Minnesota
Development Commission
(320) 235-8504 or www.mnmdc.org

**Table 3H
County Feedlot Program Contacts**

County	County Contact	Office	Phone	Email
Carver	Rachel Matthews	Environmental Services	(952) 361-1813	rmatthews@co.carver.mn.us
Kandiyohi	Kim Larson	Environmental Services	(320) 231-6288	klarson@co.kandiyohi.mn.us
McLeod	Roger Berggren	Environmental Services	(320) 864-1218	roger.berggren@co.mcleod.mn.us
Renville	Eric Van Dyken	Environment and Community Development	(320) 523-3768	eric_v@co.renville.mn.us
Sibley	Jeff Majeski	Environmental Services	(507) 237-4095	jeffm@co.sibley.mn.us

**Table 3I
County Feedlot Questionnaire**

Questions	County				
	Carver	Kandiyohi	McLeod	Renville	Sibley
When was your County's feedlot ordinance adopted?	1996	No Ordinance	2002	2001	1997
Is your County's feedlot ordinance compliant with MN Rules Ch. 7020?	Yes	No Ordinance	Yes	Yes	Yes
Approximately how many feedlots are in your County?	428	560	480	411	651
Is your County delegated to administer State feedlot rules?	Yes	Yes	Yes	Yes	Yes
What type of feedlot inventory has been conducted in your County?	Level II	Level II	Level II	Level II	Level II
What percentage of feedlots in your County are registered with the MPCA?	100%	90%	98%	100%	98%
What percentage of your County's feedlots has had a walk through inspection?	75%	97%	75%	10%	100%
How are feedlots that pose a pollution potential primarily identified?	Inspections Complaints	Inspections Complaints	Inspections Complaints	Inspections Complaints	Inspections Complaints

Four out of the five counties within the BCWD have adopted a feedlot ordinance, all of which conform to MN Rules 7020. Only Kandiyohi County does not have a feedlot ordinance in place. All five counties are delegated to administer the State feedlot program and have conducted a Level II feedlot inventory. The percentage of feedlots that have registered with the MPCA is 90 percent or greater in all counties. Four of five counties have conducted walk through inspections on 50 percent or more of their feedlots. In each county, feedlots that pose a pollution potential are primarily identified through inspections and complaints.

Map 3B displays the location of feedlots in the BCWD. Table 3J provides a breakdown of the number of feedlots per county within the District. Both Map 3B and Table 3J are based upon each county's feedlot inventory.

Table 3J
Feedlots within the BCWD per County

County	# of Feedlots	# of Animal Units
Carver	5	406
Kandiyohi	8	5,543
McLeod	148	24,389
Renville	72	17,408
Sibley	23	2,548
Total	256	50,294

References

- Carver County Environmental Services - www.co.carver.mn.us
- Kandiyohi County Environmental Services - www.co.kandiyohi.mn.us
- McLeod County Environmental Services - www.co.mcleod.mn.us
- Minnesota Pollution Control Agency - www.pca.state.mn.us
- Renville County Environment and Community Development - www.co.renville.mn.us
- Sibley County Environmental Services - www.co.sibley.mn.us

Taskforce Recommended Initiatives

- ✓ **Policy Guideline:** Feedlots should be held accountable to County and State regulations.
- ✓ **Policy Guideline:** Unrestricted access of livestock to waterways should be prevented.

INDIVIDUAL SEWAGE TREATMENT SYSTEMS

Priority Issue 4

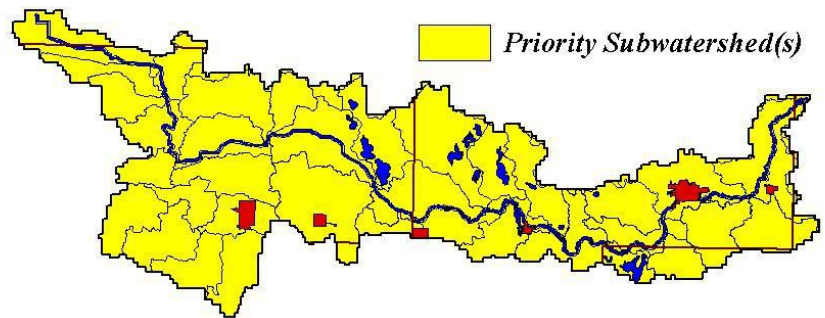
Issue Overview Many Individual Sewage Treatment Systems (ISTs) within the District are failing to properly treat sewage, thus posing a threat to the quality of water resources. As a priority issue, the Overall Plan Taskforce recommended that the District examine current ISTs regulations, as well profile each county's current ISTs conditions.

Key Players Counties, MPCA

District's Role Nonregulatory – cooperator

Priority Subwatersheds

All subwatersheds



Implications and Assessments

Individual Sewage Treatment Systems (ISTs) are used for the treatment and disposal of wastewater from individual homes, clusters of homes, isolated communities, industries, or institutional facilities. When properly functioning, ISTs are an effective means of treating wastewater. However, if improperly designed, installed or maintained, ISTs have the potential to adversely impact surface and groundwater resources. Human waste contains high concentrations of microorganisms and many chemicals, including carbon, nitrogen, phosphorus, salts and trace elements. These pollutants are a public health concern and can degrade the environment.

The first State law addressing failing ISTs, known as the ISTS act, went into effect in 1994. This legislation has since been codified as Minn. Rule Chapter 7080. Chapter 7080 requires that all new construction and replacement of ISTs meet minimum statewide standards. It also systematically addresses the adequacy of existing systems through upgrading of failing systems before construction of an additional bedroom. The following are the State's objectives in regulating sewage systems through Chapter 7080.

- Keep inadequately treated sewage away from human contact to prevent disease
- Reduce levels of pathogenic bacteria and viruses discharged to the environment
- Reasonably and cost-effectively prevent groundwater contamination
- Develop clear direction for design, construction and maintenance of sewage treatment facilities

- Strive for cost effective methods of sewage treatment to maintain or improve property values
- Encourage personal responsibility for treating sewage

Under MN Statutes 115.55, which is cited below, counties are required to adopt an ISTS ordinance that complies with the MN Rules Chapter 7080. Counties are responsible for administering and enforcing their local septic system ordinances. This includes assuring there is a septic system ordinance with a permitting and inspection program. Local permits may be issued for new septic system construction and replacement for systems with the capacity to treat up to 10,000 gallons per day.

“MN Statutes 155.55, Subd. 2. Local ordinances. (a) All counties that did not adopt ordinances by May 7, 1994, or that do not have ordinances, must adopt ordinances that comply with individual sewage treatment system rules by January 1, 1999, unless all towns and cities in the county have adopted such ordinances. County ordinances must apply to all areas of the county other than cities or towns that have adopted ordinances that comply with this section and are as strict as the applicable county ordinances. Any ordinance adopted by a local unit of government before May 7, 1994, to regulate individual sewage treatment systems must be in compliance with the individual sewage treatment system rules by January 1, 1998.”

In an effort to assess current ISTS conditions within the District, a questionnaire (Table 3L) was developed and posed to each county’s ISTS program contact. Table 3K lists each county’s ISTS program contact.

**Table 3K
County ISTS Contacts**

County	County Contact	Office	Phone	Email
Carver	Joel Enfield	Environmental Services	(952) 361-1800	jenfield@co.carver.mn.us
Kandiyohi	Gary Geer	Environmental Services	(320) 231-6564	gary_g@co.kandiyohi.mn.us
McLeod	Mark Hiles	Environmental Services	(320) 864-1259	mark.hiles@co.mcleod.mn.us
Renville	Diane Mitchell	Environment and Community Development	(320) 523-3768	diane_m@co.renville.mn.us
Sibley	Jeff Majeski	Environmental Services	(507) 237-4091	jeffm@co.sibley.mn.us

**Table 3L
County ISTS Questionnaire**

Question	County				
	Carver	Kandiyohi	McLeod	Renville	Sibley
When was your County's ISTS ordinance last adopted?	April 2001	July 2001	1998	June 2000	April 2003
Is your County's ISTS ordinance compliant with MN Rules Ch. 7080?	Yes	Yes	Yes	Yes	Yes
Does your County's ISTS ordinance require a Certificate of Compliance on all property transfers?	Yes	No	No	Yes	No
Approximately how many ISTSs are in your County?	4,000	5,000	4,500	2,486	No Response
Approximately how many ISTSs are inspected in your County per year?	225	275	120	110	60
Approximately what percentage of your County's ISTSs are deemed "failing"?	66%	44%	50%	79%	75%
How are failing ISTSs discovered in your County?	Inspections Complaints	Inspections Complaints	Inspections Complaints	Inspections Complaints	Inspections Complaints
Does your County have an ISTS inventory?	Yes	No	No	No	No

According to Table 3L, each of the counties are in compliance with MN Statutes 155.55, requiring counties to adopt an ISTS ordinance that complies with MN Rules Chapter 7080. Both Carver and Renville Counties have an additional requirement in their ordinance, requiring a Certificate of Compliance on all property transfers. Four counties reported more than 100 ISTS inspections per year, which is an appreciable number, but many systems are still not adequately treating sewage. In fact, four counties reported 50 percent or more failing systems. These figures are in excess of the statewide average of failing ISTSs, which is approximately 33 percent. In each county, failing ISTSs are discovered through inspections and complaints. Only Carver County has developed an inventory of ISTSs.

References

- Carver County Environmental Services - www.co.carver.mn.us
- Kandiyohi County Environmental Services - www.co.kandiyohi.mn.us
- McLeod County Environmental Services - www.co.mcleod.mn.us
- Minnesota Pollution Control Agency - www.pca.state.mn.us
- Renville County Environment and Community Development - www.co.renville.mn.us
- Sibley County Environmental Services - www.co.sibley.mn.us

Taskforce Recommended Initiatives

- ✓ ***Policy Guideline:*** ISTSs should be held stringently accountable to County and State regulations.
- ✓ ***Policy Guideline:*** The District should notify the respective County when a ISTS failing to properly treat sewage is discovered.

WASTEWATER TREATMENT FACILITIES (Priority Issue 5)

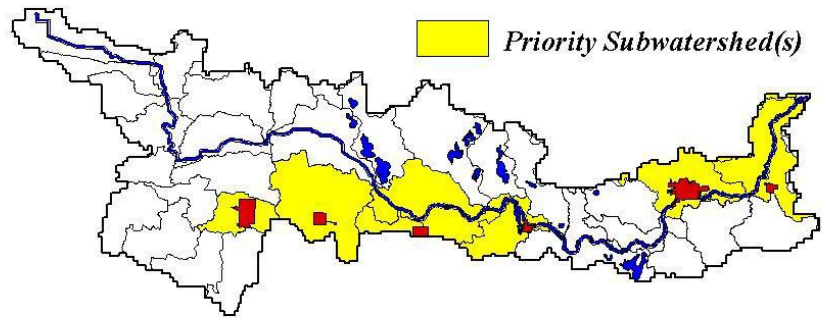
Issue Overview: The discharge from wastewater treatment facilities occasionally impairs the water quality of the Buffalo Creek and its tributaries. As a priority issue, the Overall Plan Taskforce recommended that the District profile current State discharge requirements.

Key Player(s): Cities, MPCA

District's Role: Nonregulatory – cooperator

Priority Subwatershed(s):

- Buffalo Creek (19038)*
- Buffalo Creek (19056)*
- Buffalo Creek (19057)*
- Judicial Ditch #15 (19073)*
- Judicial Ditch #15 (19076)*
- Silver Creek (19037)*
- Unnamed (19058)*



Implications and Assessments:

The MPCA is responsible for issuing permits that establish the terms and conditions that must be met when a wastewater treatment facility discharges wastewater to surface or ground waters of the State. The permit is jointly issued under two programs: the National Pollution Discharge Elimination System (NPDES) and the State Disposal System (SDS). The NPDES is a Federal program established under the Clean Water Act, aimed at protecting the nation's waterways from point and nonpoint source pollution. The SDS is a State program established under Minn. Stat. §115. In Minnesota, when both permits are required they are combined into one NPDES/SDS permit.

NPDES/SDS permit requirements vary case by case, and information provided on the application helps the MPCA determine which regulatory requirements to apply in the permit. The application requests information on design flows of the facility, the route that treated wastewater will travel to surface water and a description of the existing or proposed treatment system. The application may also request information regarding the design influent concentrations for biological oxygen demand (CBOD), total suspended solids (TSS), total phosphorus and ammonia nitrogen and a description of industrial flows.

The MPCA sets effluent limitations to protect water quality standards and the designated uses of waters of the State (Standards and use classifications are specified in Minn. R. 7050 and 7052). All municipal and other point source dischargers of sewage are required, at a minimum, to provide secondary treatment. Minimum secondary treatment effluent limits include those listed in Table 3M.

Table 3M
Minimum Effluent Limitations for Secondary Treatment

Parameter	Limiting Concentration or Range
5-day CBOD (CBOD5)	25 mg/L
Fecal Coliform Organisms	200 organisms/100 ml
Total Suspended Solids (TSS)	30 mg/L
pH Range	6.0 – 9.0 SU
Phosphorus	1 mg/L

Effluent limits more stringent than the minimum secondary treatment requirement may be assigned to a discharge where stream flows are not adequate to protect water quality standards and designated uses (for example, seasonal ammonia limits). The MPCA considers a number of factors in developing effluent limits for a particular discharge, including the characteristics of the receiving water (use classification, water quality standards, flow characteristics) and the discharge (design flow, discharge duration and frequency). Toxic pollutants may also be evaluated to ensure protection of humans, aquatic life and wildlife.

Table 3N
Typical Wastewater Monitoring Requirements

Monitoring Location	Parameter	Frequency
Influent	Flow	Daily
	CBOD	Monthly
	TSS	Monthly
	PH	Monthly
	Total Phosphorus	Monthly
Effluent	CBOD	Monthly
	TSS	Monthly
	PH	Monthly
	Dissolved Oxygen	Monthly
	Chlorine Residual	Daily
	Fecal Coliform	Monthly
	Total Phosphorus	Monthly
	Emergency Incident Monitoring	Flow
	CBOD	2x/week during incident
	TSS	2x/week during incident
	Fecal Coliform	2x/week during incident

Once a NPDES/SDS Permit is obtained, the permittee is required to monitor the treatment system and submit Discharge Monitoring Reports to the MPCA. The monitoring requirements vary depending on the waste-stream characteristics, size of the facility, receiving water concerns and the type of treatment proposed. Table 3N lists the standard monitoring requirements for most municipal and/or domestic treatment facilities currently permitted by the State.

Municipal permittees are frequently required to monitor other parameters, including phosphorus and ammonia nitrogen. In the event of a bypass, the MPCA requires that the permittee notify the Department of Public Safety Duty Officer, as well as implement necessary emergency incident monitoring. For bypasses lasting multiple days, monitoring of flow, CBOD, TSS and Fecal coliform bacteria is required. However, for bypasses lasting one day or less, sampling is generally not required.

References

Environmental Protection Agency - www.epa.gov

Minnesota Pollution Control Agency - www.pca.state.mn.us

Taskforce Recommended Initiatives

- ✓ **Policy Guideline:** Municipal sewer systems should be held accountable to State and Federal discharge requirements.
- ✓ **Action Item:** Make a formal request to each County's emergency management office to send Duty Officer Reports to the District.