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Amy Trisko  
Sauk River Watershed District  
524 Fourth Street South  
Sauk Centre, MN 56378

April 14, 2005

Dear Amy,

We have received your final report and attachments for the RCM/MLA Citizen Volunteer Monitoring Plan program, as funded through LCMR\*.

Your document satisfies the reporting requirements and completes the monitoring plan training, implementation, and contract components for the program.

It has been a pleasure to work with you and your team. Please keep in touch with monitoring activities and updates on your program. Also let us know of future monitoring/training needs that may be of interest to you or your citizen volunteer monitoring group.

Sincerely,

Angie Becker Kudelka  
River Watch Director  
Rivers Council of Minnesota

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\* Funding for this project was recommended by the Legislative Commission on Minnesota Resources (LCMR) from the Minnesota Environment and Natural Resources Trust Fund.

# SAUK RIVER WATERSHED DISTRICT

524 4th Street South

Sauk Centre, Minnesota 56378

Phone: (320) 352-2231 Fax: (320) 352-6455

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JAN 20 2005

January 17, 2005

Angie Becker Kudelka  
Rivers Council of Minnesota  
1269 2<sup>nd</sup> Street North  
Suite 200  
Sauk Rapids, MN 53679

Dear Angie,

Enclosed, please find the completed Sauk River Watershed District Care for Your Waters Citizen Volunteer Program Final Write-up and reimbursement request.

If you have any questions, please contact me at 320-352-2231.

Sincerely,



Amy Trisko  
Education/ Monitoring  
Sauk River Watershed District

#### BOARD OF MANAGERS

Kay Cook, Chub Hensley, Ed Hunstiger, Jim Kral, Allan Kuseske, Sharen Kutter, Bob Mostad, Virgil Rettig and Roger Schmidt

#### STAFF

Julie Klocker, Starla Arceneau, Lynn Nelson, Melissa Bromenshenkel and Amy Trisko

“Water Quality Is Our Concern”

## 2004 End of Season Report for the Citizen Monitoring Program Ashley and Hoboken Creeks Sub Watershed Volunteer Monitoring Sites

The SRWD tech team finished its workplan in April 2004 and began the monitoring season in three priority areas for 2004: the impaired Sauk River between Osakis Lake and Big Sauk Lake, Ashley & Silver Creek sub-watersheds, and Hoboken Creek sub-watershed, all of which flow into Big Sauk Lake which has been recently put on the State's TMDL list. Since these areas are not set to be monitored until 2006, the SRWD tech team felt it critical to collect some preliminary data in this area through the citizen volunteer program.

The SRWD believes strongly that a citizen monitoring network helps identify areas of concern, develop strategies and prioritize activities for improving water quality, and track progress toward improvement. The District and partnering agencies have a limited resource and feel volunteers can provide assistance to improving water quality. Giving volunteers the necessary education and information to help this natural resource, transforms citizens and allows for locally led, citizen-based resource protection.

The goals of the program were clearly defined and the tech team feels we have met all short term goals and are continuing to meet our long term goals of the program. The goals are listed below in black and in red is how we've evaluated their accomplishment.

- Open communication lines between agencies and volunteers. Many of the volunteers in the area are aware of this program and although they are not working directly on these streams, they have decided to join the SRWD's monitoring team collecting secchi, precipitation and lake level readings in the Big Sauk Lake area. Volunteers have also become more aware of our presence in the watershed along with partnering agencies such as the Rivers Council of MN, and Soil and Water Conservation Districts.
- Create a network of volunteers covering every management district within the watershed both for monitoring and education purposes. Through this program we have created a network of volunteers in this large management district- the Sauk Lake Minor.
- Provide adequate and consistent training for volunteers. We will continue to train and provide equipment for volunteers in the 10 management districts to help locate areas of potential concern.
- Expand monitoring locations and data collection. At the 2005 volunteer workshop/training, the District will locate sensitive areas in the watershed that volunteer activity is currently limited. We will contact area lake associations and environmental clubs looking for volunteers who would be willing to help monitor these areas and provide free training and equipment to them.
- Create an awareness of our district's presence and purpose. Through newsletters, the media and public presentations, the district is well represented throughout the watershed. We will continue to attend community meetings to share our concern and passion for the fresh water resources within the Sauk River Watershed.

- Provide another means of agency contacts for citizens. We often refer citizens to other agencies who offer programs that we do not and answers to questions that we are unable to answer.
- Create a support structure for volunteers. Through the volunteer program, we have established relationships with the volunteers who come to us with questions and we offer guidance and support.
- Learn about what we can do for volunteers and what volunteers need from us. The more we work with volunteers, the greater our understanding and scope becomes of what they're looking for, what we can do for them, and what volunteering is all about to them. The program is strengthening by the day.

## **Preparations:**

### ***Locations***

Site locations for this project were chosen based on high priority and special interest.

They include:

1. Sauk River between Osakis Lake and Sauk Lake: on State's TMDL list for low DO; no monitoring data obtained; contains an area with sensitive soils; little information on land use/condition.
2. Ashley Creek into Sauk Lake: on State's TMDL list for low DO; monitoring indicates a problem; domestic animal sightings in waterways; banks eroding.
3. Hoboken Creek into Sauk Lake: Sited for low DO, high phosphorus concentrations and sediment loading, domestic animals in waterways.

### ***Equipment***

To prepare our volunteers, the tech team investigated safe monitoring sites, created maps on their locations, and placed in the volunteer's field notebook for quick reference. We prepared two 'field tubs' which included:

- Monitoring manuals
- Maps
- Field sheets
- Boots
- Safety road vests
- Safety cones
- Van dorn water sampler
- First aid kit
- Transparency tube
- Portable DO Meter
- Sample bottles in cooler

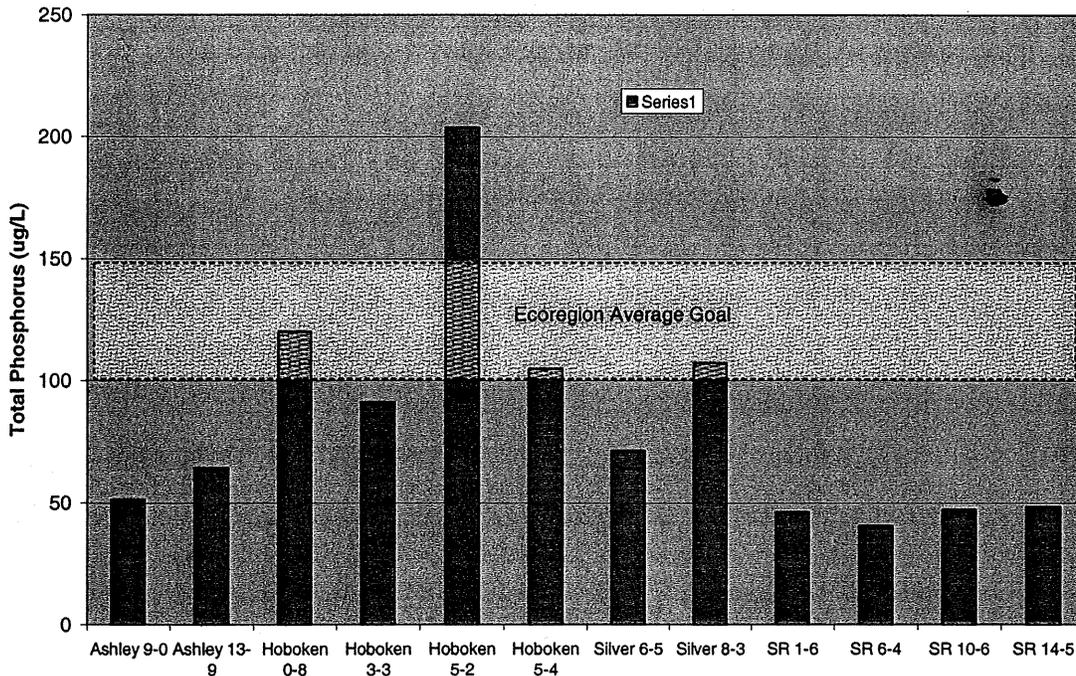
The volunteers would stop by our office, pick up the 'field tub' and sample bottles and be on their way to monitoring. It worked out well to have all the equipment ready to go, in one place, and available anytime. There were few obstacles we ran into. One was with the DO Smart Meters that

we purchased from Ben Meadows. After three times out and comparing them with the SRWD's meter we decided to send the smart meters back and purchase a YSI 550A which proves to be more reliable and easier to use. The other obstacle was that the van dorn was not always a practical solution to collecting the water samples. The volunteers decided to use a golf ball retriever that had a bottle attached to capture samples.

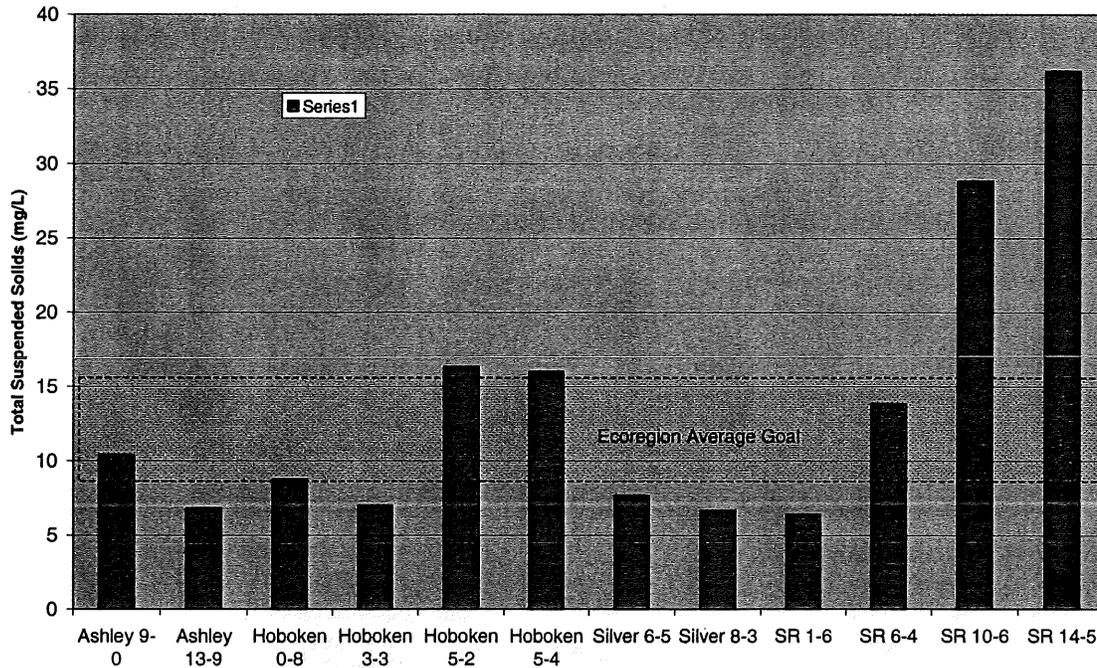
**Sample Analysis**

- Volunteers monitored 4 tributaries to Big Sauk Lake throughout the 2004 water monitoring season.
- Water quality data was collected 7 times per monitoring site. Although it is a glimpse into the quality of water in the streams, it is recommended to have 15 samples per season.
- The 2004 data can be used to determine elevated TP and TSS concentrations within each sub-watershed.

2004 Summer Averages for Total Phosphorus concentrations for Volunteers Sites  
(Ashley Creek, Hoboken Creek and Sauk River)



**2004 Summer Average Total Suspended Solids Concentrations for Volunteer Data (Ashley Creek, Hoboken Creek and Sauk River)**



After all data was returned, our data analyzer reviewed it and determined a couple of things. Based on the samples collected it appears that the TSS concentrations increase as you travel up the Sauk River as well as up Hoboken Creek. Granted this is only one year of data it will help our project partners focus in these areas to address the TSS concentrations. Next year, the SRWD and volunteers will document the sites with pictures and descriptions, create a list of landowners on the tributaries, and contact potential BMP participants.

It is the SRWD recommendation that monitoring continues at the present sites (TP/TSS) along with the SRWD's designated sites on Hoboken and Ashley and two new SRWD sites on Silver Creek and the Sauk River between Osakis and Sauk Lake. Monitoring should begin in March 2005.

## 2004 End of Season Budget for Citizen Monitoring Program

### Revenues:

<i>Item</i>	<i>Description</i>	<i>Budget</i>	<i>Expected Revenue following Years</i>	<i>Actual Expenses January 2005</i>
RCM Grant	Workshop grant	\$3,000	0	
In-Kind		\$3,141	2,880	
<b>TOTAL REVENUE</b>		<b>\$6,141</b>	<b>\$2,880</b>	

### Expenses:

<i>Type of Expense</i>	<i>(unit price)</i>	<i>Budget</i>	<i>Expected Costs following Years</i>	<i>Actual Expenses January 2005</i>
Presenter/training time	40*25	1000	1000	1000
Training manuals	50	50	30	50
Facility Rental	100	100	100	100
Food and door prizes	350	350	350	350
Invitations/Communications	250	250	250	250
T-tubes	90	90	0	90
Tape measures	36	36	0	36
Rain gauges	30	30	0	30
Field tubs	15	15	0	15
Field books	20	20	0	20
Sample bottles	50	50	0	50
Mileage	1200miles*.375	450	450	450
3 Sites labdata SRWD in-kind	700	700		683.06
12 sites/lab/ certified data	2100	2100	0	\$ 1,956.00
DO Meter	550	1100	0	\$ 870.00
Van Dorn	60	60	0	\$ 120.66
Colorimeter	500	1000	0	\$ -
Stakes/poles	20	20	0	\$ -
First aid kits	25	25	0	\$ 33.87
Staff gauges	50	50	0	\$ 50.00
<b>Total</b>				<b>\$ 3,030.53</b>
				<b>\$ 3,000.00</b>
				<b>RCM Grant</b>
<b>TOTAL EXPENSES 2004</b>		<b>\$7,496</b>	<b>\$2,180</b>	<b>\$ 6,154.59</b>

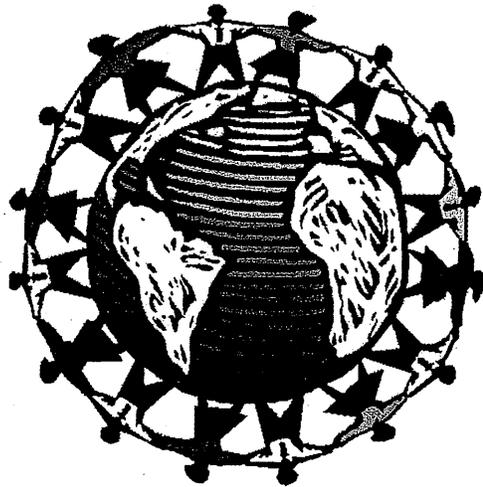
*BALANCE (revenue minus expense) : (\$1,355)*

## 2004 End of Season Budget for Citizen Monitoring Program

### In-Kind Contributions:

<i>Item</i>	<i>Description</i>	<i>Value</i>	<i>Expected Contribution the following Years</i>	<i>Actual Expenses January 2005</i>
Facility Rental	Training session	\$100	100	100
Food and door prizes	Training session	\$350	350	350
Invitations/Communications	3 written contacts before session	\$250	250	250
T-tubes	3/\$30	\$90	0	90
Tape measures	3/\$12	\$36	0	36
Rain gauges	3/\$10	\$30	0	30
Field tubs		15	\$15	0
Field books and manuals		70	70	30
Sample bottles		50	50	0
Mileage	1200*.375		450	450
Training time –agency's	40hrs*25		1000	1000
4 sites lab samples	\$1,500/site		\$700	700
<b>TOTAL IN-KIND VALUE</b>			<b>\$3,141</b>	<b>2,880</b>
				<b>\$ 3,141.00</b>

# **'CARE FOR YOUR WATERS' CITIZEN MONITORING PROGRAM**



# **'CARE FOR YOUR WATERS' CITIZEN MONITORING PROGRAM**

2004 Edition

**AMY TRISKO**  
SAUK RIVER WATERSHED DISTRICT

**MELISSA BROMENSHENKEL**  
SAUK RIVER WATERSHED DISTRICT

**BOB BJORK**  
BIG SAUK LAKE ASSOCIATION

**GENE WALDORF**  
BIG BIRCH LAKE ASSOCIATION

Minnesota State Local Unit of Government  
Sauk River Watershed District  
Monitoring Department  
524 4<sup>th</sup> Street S., Sauk Centre, MN 56378  
(320) 352-2231  
[www.saukriver-watersheddistrict.org](http://www.saukriver-watersheddistrict.org)

Funding for this project was recommended by the Legislative Commission on Minnesota Resources (LCMR) from the Minnesota Environment and Natural Resources Trust Fund.

The goal of this grant is to enhance and expand the ability of citizen volunteers to collect water quality data that will be useful for lake and stream assessments and management. Minnesota Lakes Association and Rivers Council of Minnesota, with assistance from River Network, will work collaboratively to provide training, technical support, education and communications for individuals and organizations statewide interested in citizen volunteer lake and stream monitoring.

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## **Chapter 1: Vision -**

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The Sauk River Watershed District and its partners are looking to establish a volunteer network to collect data in areas that are not currently monitored, provide education to area youth and adult residents and supplement District efforts to protect, preserve and improve water quality. The SRWD tech team has chosen three priority areas for 2004: the impaired Sauk River between Osakis Lake and Big Sauk Lake, Ashley & Silver Creek sub-watersheds, and Hoboken Creek sub-watershed, all of which flow into Big Sauk Lake which has been recently put on the State's TMDL list. Since these areas are not set to be monitored until 2006, the SRWD tech team feels it is critical to collect some preliminary data in this area. To accomplish this mission, it is crucial to have volunteers.

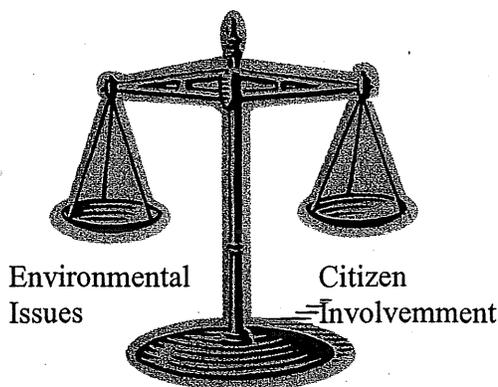
This volunteer monitoring plan illustrates a small piece of the Districts overall monitoring efforts. A map outlining all of the Districts monitoring sites is included in the appendix.

### **Our Program Goals**

We have set up both first year and long term goals for the program. We understand these may change, but feel these are a good start.

- Open communication lines between agencies and volunteers.
- Create a network of volunteers covering every management district within the watershed both for monitoring and education purposes.
- Provide adequate and consistent training for volunteers.
- Expand monitoring locations and data collection.
- Create an awareness of our district's presence and purpose.
- Provide another means of agency contacts for citizens.
- Create a support structure for volunteers.
- Learn about what we can do for volunteers and what volunteers need from us.

The SRWD believes strongly that a citizen monitoring network helps identify areas of concern, develop strategies and prioritize activities for improving water quality, and track progress toward improvement. The District and partnering agencies have a limited resource and feel volunteers can provide assistance to improving water quality. Giving volunteers the necessary education and information to help this natural resource, transforms citizens and allows for locally led, citizen-based resource protection.



## Mission -

The Sauk River watershed District (SRWD) is a local unit of state government established by petition from area residents and was founded on July 22, 1986. The mission statement of the SRWD is to *"Apply our unique abilities and authorities in ways that protect and enhance our watershed's resources for today and tomorrow."* The SRWD is mandated by the state to provide stewardship and guidance to the Sauk River Watershed residents on land use decisions.

The Sauk River watershed extends from the Mississippi River near St. Cloud into the eastern portions of Douglas County to within 3 miles of Alexandria. The watershed, like the Sauk River, extends in a northwest to southeast direction. The overall watershed is about 75 miles in length with some areas being up to 20 to 30 miles in width. The Sauk River meanders for 120 miles. See attached base map on page 7.

According to data from the Minnesota Land Management Information Center (LMIC), the Sauk River watershed covers over 667,000 acres or approximately 1,041 square miles across portions of five counties. The portions of counties contained within by the watershed include southeastern Douglas County, northeastern Pope County, southwestern Todd County, northern Meeker County, and the center third of Stearns County. (A very small portion of the watershed, 6 acres, overlaps into Morrison County.)

The District is a non-profit, quasi-local government with jurisdiction in 5 counties: Pope, Todd, Stearns, Douglas and Meeker. There are 58,879 residents living within the Watershed boundaries with five staff and 38 volunteers working with them.

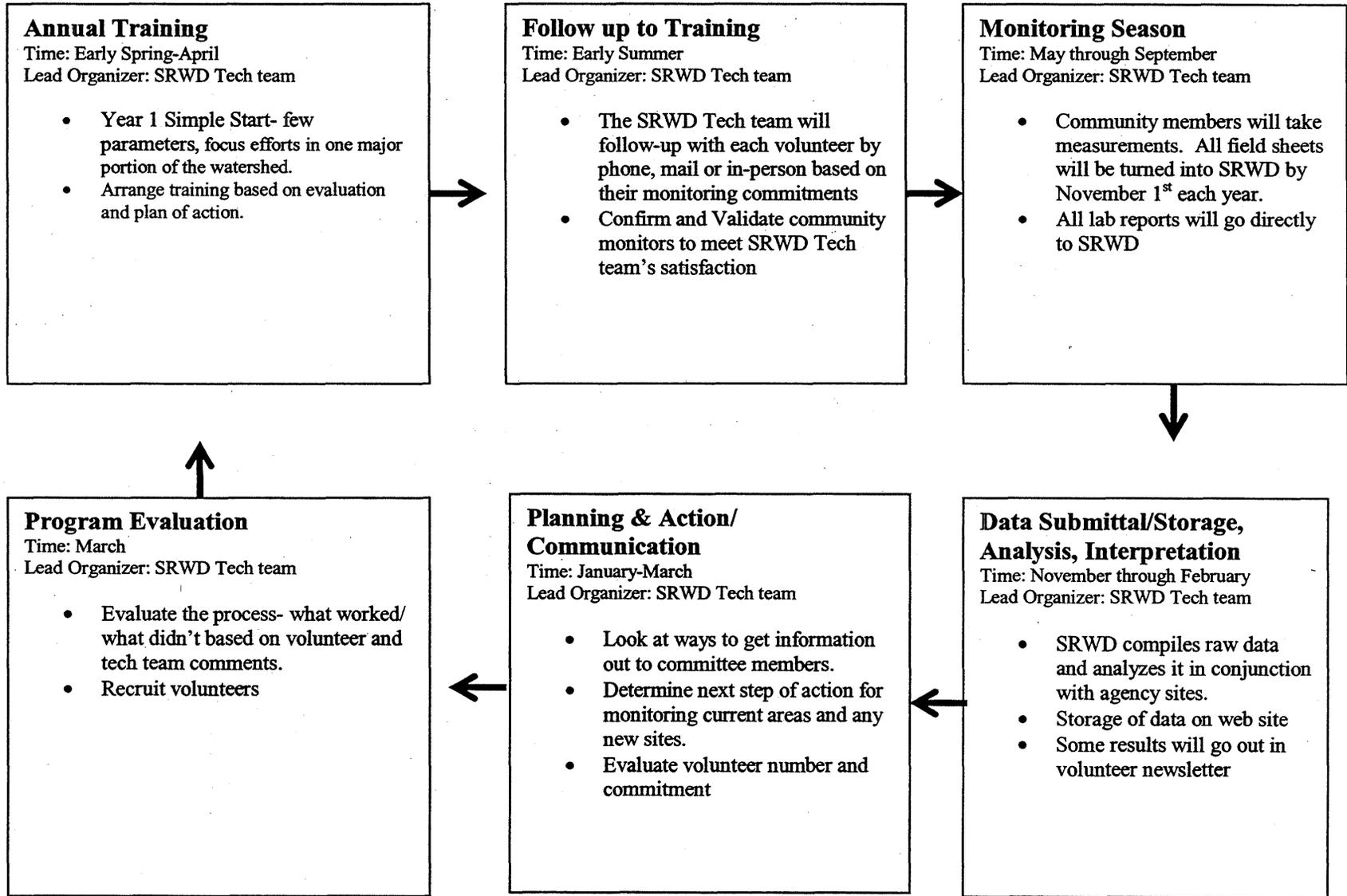
**Included in the appendix** are maps which highlight the waters of interest.

1. Sauk River between Osakis Lake and Big Sauk Lake
2. Ashley Creek into Sauk Lake
3. Hoboken Creek into Sauk Lake
4. Silver Creek into Hoboken Creek
5. SRWD Monitoring Sites

Areas with high priority and special interest include:

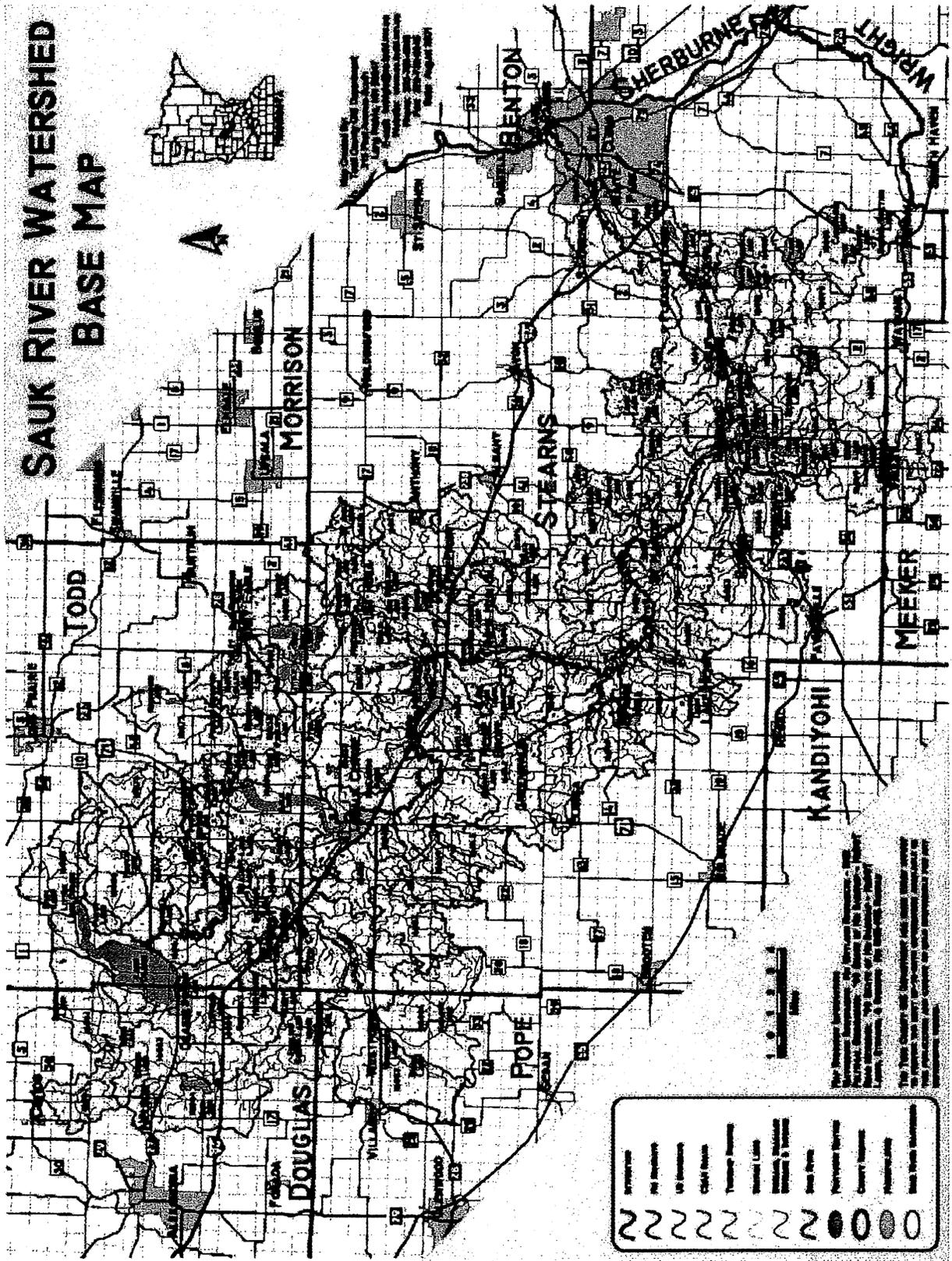
1. Sauk River between Osakis Lake and Sauk Lake: on State's TMDL list for low DO; no monitoring data obtained; contains an area with sensitive soils; little information on land use/condition.
2. Ashley Creek into Sauk Lake: on State's TMDL list for low DO; monitoring indicates a problem; animal sightings in waterways; banks eroding.
3. Hoboken Creek into Sauk Lake: Sited for low DO, high phosphorus concentrations and sediment loading

# Flow Chart of Annual Citizen Monitoring Cycle



# SAUK RIVER WATERSHED BASE MAP

A



## **Chapter 2: General Watershed Information-**

### **Specific Area of Interest: 1. Sauk River between Osakis Lake and Sauk Lake**

<b>TOPIC</b>	<b>INFORMATION</b>
Major Basin	Upper Mississippi River Basin
Eco-region	North Central Hardwoods Forest Eco-region
Location	Douglas, Todd
Classification Numbers	HUC# 07010202-502
Acreage of sub-watershed	489.5 Square Kilometers
River Miles	18 miles
Land use predominantly	Pasture, Row Crops, Waterfowl Management Areas, Residential

### **Specific Area of Interest: 2. Ashley Creek and Silver Creeks into Sauk Lake**

<b>TOPIC</b>	<b>INFORMATION</b>
Major Basin	Upper Mississippi River Basin
Eco-region	North Central Hardwoods Forest Eco-region
Location	Pope, Todd, Stearns, Douglas Counties
Classification Numbers	HUC# 07010202-503
Acreage of sub-watershed	65.5 square miles
River Miles	
Land use predominantly	Cropland, Residential, Marsh

### **Specific Area of Interest: 3. Hoboken Creek into Sauk Lake**

<b>TOPIC</b>	<b>INFORMATION</b>
Major Basin	Upper Mississippi River Basin
Eco-region	North Central Hardwoods Forest Ecoregion
Location	Stearns County
Classification Numbers	HUC# 07010202-522
Acreage of sub-watershed	29 Square miles
River Miles	
Land use predominantly	Cropland, Residential, Marsh, Meadow

**Current Status of Your Waters of Interest:**

1) Water of Interest (name, location, and/or segment/ lake number)	2) Use Classification s WQS-7050	3) Lakes: What is the Carlson Trophic Status? 305(b)	4) Assessed?	5) Are there Uses that are Fully Supported? 305(b) (List)	6) Are there Uses that are NOT Fully Supported? 305(b) (List)	7) Streams: Does Ecoregion Data Indicate any Threats? 305(b) (List)	8) If Impaired, what is the Affected Use? 303(d)	9) If Impaired, what is the Pollutant or Stressor? 303(d)	10) Suspected Sources 305(b)
Sauk River Osakis to Sauk Lake (TMDL)	2B, 3B, 4A-B, 5, 6	N/A	Y	No	Yes	Oxygen depletion	Aquatic	Low oxygen	Non-point
Hoboken Creek	2B, 3B, 4A-B, 5, 6	N/A	Y	No	Yes	Yes	DO	Low oxygen	Animal waste & Incompliant septic systems
Ashley Creek	2B, 3B, 4A-B, 5, 6	N/A	Y	No	Yes	Yes	DO	Low Oxygen	Animal Waste & incompliant septic systems
Silver Creek	2B, 3B, 4A-B, 5, 6	N/A	Y	No	Yes	Yes			Animal Waste & incompliant septic systems

### Things valued in the watershed

1. Canoe access points
2. Shoreline and boat fishing
3. Parks and Recreation
4. Swimming lakes along stretches of the River
5. Scenic views

### Use Classifications compared to actual uses and values.

1) Water of Interest	2) Use Classifications	Actual Uses and Values (from own experience)
Ashley Creek	2B, 3B, 4A-B, 5, 6	Cattle grazing, agricultural
Hoboken Creek	2B, 3B, 4A-B, 5, 6	Cattle grazing, agricultural
Sauk River Osakis Lake to Sauk Lake (TMDL)	2B, 3B, 4A-B, 5, 6	Fishing lakes along river stretch. Scenic views
Silver Creek	2B, 3B, 4A-B, 5, 6	Cattle grazing, agricultural

### Issues and efforts in the four priority areas of this plan

Issue	Known Effort to Address the Issue	Evaluating Known Efforts, Identifying Niches
Low dissolved oxygen	The MPCA has acknowledged its condition and is searching for funding.	The SRWD along with volunteers will chemically monitor for DO
Visual Assessments Unknown	Condition unknown	Volunteers along with staff will visually assess the stream corridors at set locations along the stream.
Sediment Loading	Funding available to do BMP's through SRWD and SWCD	The SRWD along with the County SWCDs will implement BMPs. Citizen T-tube readings and visual assessments will be used to help assess where sediment loading is greatest.
Phosphorus Loading	The MPCA has acknowledged its condition and is searching for funding.	The SRWD and citizen volunteers will chemically monitor on selected stretches to determine problem areas to be addressed by the SRWD through education and incentive programs.
Cattle in Waterways	Funding available to do BMP's from SRWD & SWCD.	Citizen volunteers will document areas of concern along the selected stretches. The SRWD will send a pamphlet out to landowners with facts and costs figures.
Eroding banks	Funding available through SRWD and SWCD	The SRWD along with the County SWCD's will implement BMPs. Citizen T-tube readings and visual assessments will be used to help assess where sediment loading is greatest.

Lack of Landowner Cooperation	Watershed District is providing outreach materials to citizens	The SRWD will have readily available pamphlets for landowners with facts, costs, and potential incentives. Hold Education forums
Septic Systems	Counties are in process of evaluating and upgrading landowner systems. SRWD provides loans	The SRWD will have readily available pamphlets for landowners with facts and costs. Hold Education forums.

The SRWD is currently monitoring the mouth of these four priority areas for dissolved oxygen, total suspended solids, total phosphorus, ortho phosphorus, ammonia, temperature, level, and flow velocity. The District also has an extensive chemical/physical monitoring program throughout select portions of the watershed. A map with professional sites can be found in the appendix.

## Chapter 3: Monitoring Goals -

The "Care For Your Waters" Program will provide a citizen monitoring network that identifies areas of concern, develops strategies and prioritizes activities for improving water quality, and tracking progress toward improvement. Local and State governments have a limited resource and feel volunteers can provide assistance to monitoring and improving water quality. Giving volunteers the necessary education and information to help protect and preserve this natural resource, transforms citizens and allows for locally led, citizen-based resource protection.

Our monitoring goals for the volunteer program include:

- Volunteers performing visual assessment of the stream channels in specified locations.
- Volunteers documenting areas of concern (erosion, habitat loss, cattle in waterways, etc...) on watershed maps.
- Volunteers collecting diagnostic data for the District on specified locations.
- Volunteers offer input to education efforts in specified areas.
- Offering volunteers the opportunity to work directly on caring for our water resources.
- Getting residents interested in and educating them on fresh-water related issues.
- SRWD interpreting data results collected by volunteers to get a diagnostic profile of the areas.

### Data Users and Uses

Topic	User/Decision Maker	Uses/Decisions	How will this get answered
Relationship between cattle and phosphorus concentration.	Quasi- local = SRWD MPCA SWCD (Lead) Local Political Reps Lake Associations	<ul style="list-style-type: none"> <li>• Zoning considerations - LPR</li> <li>• To establish a baseline to determine trends - SRWD</li> <li>• Determine the impact of potential pollutants - MPCA</li> <li>• Set priorities for correction - SWCD</li> <li>• Conservation work with landowners - SWCD</li> </ul>	<ul style="list-style-type: none"> <li>• Volunteers will collect the total phosphorus data at strategic sites selected by SRWD</li> <li>• Volunteers will do visual assessments of the areas and note any cattle areas nearby.</li> <li>• SRWD will correlate data collected by volunteers with known feedlot location</li> </ul>
Point and non-point source pollutants.	Quasi- local = SRWD (Lead) MPCA SWCD Local Political Reps Lake Associations	<ul style="list-style-type: none"> <li>• Provisions to permits - All</li> <li>• Targeted info to landowners – SWCD, LA</li> <li>• Zoning considerations – LPR, LA</li> <li>• Conservation work with landowners - SWCD</li> </ul>	<ul style="list-style-type: none"> <li>• Citizens will be collecting various data points and making visual assessments about the areas.</li> <li>• SRWD will compare remarks to known point source discharges and investigate non-point sources.</li> </ul>

Topic	User/Decision Maker	Uses/Decisions	How will this get answered
Stream bank erosion	Quasi- local = SRWD (Lead) MPCA SWCD (BMP Manager) Local Political Reps Lake Associations	Provisions to permits - All <ul style="list-style-type: none"> <li>• Target info to landowners - SWCD</li> <li>• Zoning considerations - LPR</li> <li>• Conservation work with landowners - SWCD</li> </ul>	<ul style="list-style-type: none"> <li>• Volunteers will do visual assessments.</li> <li>• SRWD will correlate it to t-tubes numbers and TSS numbers.</li> </ul>
Education	Quasi- local = SRWD (Lead) MPCA SWCD (Co-Lead) Local Political Reps Lake Associations Local Citizens	<ul style="list-style-type: none"> <li>• Establish state assessments - MPCA</li> <li>• Targeted info to landowners - SWCD</li> <li>• Zoning considerations – LPR , LC</li> <li>• Conservation work with landowners - SWCD</li> </ul>	<ul style="list-style-type: none"> <li>• SRWD will be using volunteer data to educate in concerned areas.</li> <li>• Volunteers will be assisting on educational steps implemented by SRWD.</li> </ul>

## Chapter 4: Monitoring

### Sources of Stressors, Parameters and Scale

Sources of Stressors	Parameters	Scale
Sewage	TP, DO, temp, TSS, OP, level, transparency- Volunteers. (NH <sub>4</sub> , DO, TP, OP, temp, flow, rainfall)* - SRWD	Stream Reach
Erosion	TP, DO, temp, TSS, and OP, transparency, level - Volunteers. (Flow, rainfall, TP, DO, temp, TSS, and OP)* - SRWD.	Stream Reach
Animal Manure	TP, DO, level, temp, transparency, OP - Volunteers. (Rainfall, TP, OP, TSS, NH <sub>4</sub> , DO, temp)* - SRWD.	Stream Reach
Vegetation Removal	TP, OP, DO, temperature, transparency, level, - Volunteers. Rainfall, flow,* SRWD.	Stream Reach
Nutrients	TP, DO, OP, transparency, temp - Volunteers. (Rainfall, TP, OP, DO, NH <sub>4</sub> , flow)* - SRWD.	Stream Reach

\*These parameters will be done on anchor sites by SRWD.

### Data Quality Objectives for Sampling

The sampling season runs from April to October.

Sampling Method / Parameter	Completeness	Representativeness	Comparability
OP- For diagnostic sampling purposes the SRWD recommends 8-10 data points.	2 samples per month per sample season per site. <i>Minimum of 8/year.</i>	Measurements taken mid-stream vertically & horizontally.	Use standardized sampling procedures. Collect duplicate samples as stated in protocols.
TP - For diagnostic sampling purposes the SRWD recommends 6-8 data points.	1 sample per month plus rain events (max of 4) at specified sites per sample season. <i>Minimum of 6/year.</i>	Measurements taken mid-stream vertically & horizontally.	Use standardized sampling procedures. Collect field duplicate samples as stated in protocols.
TSS - For diagnostic sampling purposes the SRWD recommends 6-8 data points.	1 sample per month plus rain events (max of 4) at specified sites per samples season. <i>Minimum of 6/year.</i>	Measurements taken mid-stream vertically & horizontally.	Use standardized sampling procedures. Collect field duplicate samples as stated in protocols.
Temperature For diagnostic sampling purposes the SRWD recommends 8-10 data points.	2 samples per month per sample season per site. <i>Minimum of 8/year.</i>	Measurements taken mid-stream vertically & horizontally.	Use standardized sampling procedures. Collect field duplicate samples as stated in protocols.

Dissolved Oxygen - For diagnostic sampling purposes the SRWD recommends 8-10 data points.	2 samples per month per sample season per site. <i>Minimum of 8/year.</i>	Measurements taken mid-stream vertically & horizontally.	Use standardized sampling procedures. Collect field duplicate samples as stated in protocols.
Transparency - For diagnostic sampling purposes the SRWD recommends 8-10 data points.	2 samples per month per sample season per site. <i>Minimum of 8/year.</i>	Measurements taken mid-stream vertically & horizontally.	Use standardized sampling procedures. Collect field duplicate samples as stated in protocols.
Water Level - For diagnostic sampling purposes the SRWD recommends 8-10 data points.	2 samples per month per sample season per site. <i>Minimum of 8/year.</i>	Measurements taken mid-stream from reference point on culvert/bridge.	Use standardized sampling procedures.

### Sample Collection Methods:

Parameter	What will be sampled	What will be used to collect sample	Sample Containers/ Preservation	Quantity of sample to be collected	Number of samples to be collected per site	Sampling Methods Reference and Source
OP	Stream mid-channel	Van Dorn	HDPE Bottles	250 mL	1	SRWD & MPCA Manuals
TP	Stream mid-channel	Van Dorn	HDPE Bottles	250 mL	1	SRWD & MPCA Manuals
DO	Stream mid-channel	Direct measurement with probe	None	n/a	1	SRWD & MPCA Manuals
Temperature	Stream mid-channel	Direct measurement with probe	None	n/a	n/a, but taking 2 readings.	SRWD & MPCA Manuals
Transparency	Stream mid-channel	Transparency Tube	None	60 mL	n/a, but taking 2 readings.	SRWD & MPCA Manuals
TSS	Stream mid-channel	Van Dorn	HDPE Bottles	250 mL	1	SRWD & MPCA Manuals
Level	Stream mid-channel	n/a	None	n/a	n/a	SRWD & MPCA Manuals

### Data Quality Objectives for Analysis

Parameter	Accuracy	Precision	Detection Limit/Measurement Range
OP	Not available at this time.	Not available at this time.	Not available at this time.
TP	DHIA Lab Certified.	See DHIA Lab Manual	Minimum detection limit .005 mg/L
DO	+-.3 mg/L +2% air Compared to Standard	+3 mg/L	Range 0-50 mg/L 0-500%
Temperature	N/A	+-.3°C	-5° to 45°
Transparency	N/A	+3 cm	Range <1 cm to 60cm. Detection limit 60 cm.
TSS	DHIA Lab Certified.	See DHIA Lab Manual	Minimum detection limit 1 mg/L
Level	Not available.	+-.05 ft.	Range 0 to 3.3 meters

**Sample Analysis Methods:**

Parameter	Where samples will be analyzed	How Sample Transported to Lab	Maximum holding time before Analysis	Analytical Method Reference and Source	Brief Description of Method	Reporting Units
OP	SRWD Office	Cooler on ice	24 hours	Not available at this time.	See SRWD Care for your Waters Manual.	Mg/L
DO	On site	n/a	On site	n/a	See Manufacturers Manual	Mg/L
Temperature	On site	n/a	n/a	n/a	See Manufacturers Manual	°F
TP	Certified Laboratory	Preservative in bottle and cooler on ice	72 hours with preservatives	Automated 4500-P F	See SRWD Care for your Waters Manual.	Mg/L
TSS	Certified Laboratory	Cooler on ice	24 hours	Gravimetric, 105C 2540D	See SRWD Care for your Waters Manual.	Mg/L
Transparency	On site	n/a	n/a	n/a	Use MPCA Stream	cm

## Sampling Site List

Site #	Brief Description of Location (Code for Segment, if any)	How and Where the Site Will Be Sampled	Type of Site	Parameters
SR 14-5	Sauk River between Osakis Lake and Sauk Lake. Approximately 14.5 river miles west of Sauk Lake	OP taken using Van Dorn sampler, level taken with tape measure at reference point on upstream side, DO & temperature taken at reference point with DO meter, transparency measurement made by transparency tube.	Stream Impact Assessment Sites*	OP, level, DO, temperature, transparency
SR 10-6	Sauk River between Osakis Lake and Sauk Lake. Approximately 10.6 river miles west of Sauk Lake	TP, OP, & TSS samples taken using Van Dorn sampler, level taken with tape measure at reference point, upstream side, DO & temperature taken at reference point with DO meter, transparency measurement made by transparency tube.	Stream Impact Assessment Sites*	TP, OP, TSS, DO, temperature, level, transparency
SR 6-4	Sauk River between Osakis Lake and Sauk Lake. Approximately 6.4 river miles northwest of Sauk Lake	TP, OP, & TSS samples taken using Van Dorn sampler, level taken with tape measure at reference point, upstream side, DO & temperature taken at reference point with DO meter, transparency measurement made by transparency tube.	Stream Impact Assessment Sites*	TP, OP, TSS, DO, temperature, level, transparency
SR 1-6	Sauk River between Osakis Lake and Sauk Lake. Approximately 1.6 river miles north of Sauk Lake	OP taken using Van Dorn sampler, level taken with tape measure at reference point upstream side, DO & temperature taken at reference point with DO meter, transparency measurement made by transparency tube.	Stream Impact Assessment Sites*	OP, level, DO, temperature, transparency
Ash 14-4	Headwaters of Ashley Creek	TP, OP, & TSS samples taken using Van Dorn sampler, level taken with tape measure at reference point on culvert, DO & temperature taken at reference point with DO meter, transparency measurement made by transparency tube.	Control Site	TP, OP, TSS, DO, temperature, level, transparency
Ash 9-0	Segment of Ashley Creek approximately 9 river miles from it's entrance to Sauk Lake	OP taken using Van Dorn sampler, level taken with tape measure at reference point on culvert, DO & temperature taken at reference point with DO meter, transparency measurement made by transparency tube.	Stream Impact Assessment Sites*	OP, level, DO, temperature, transparency
Hob 5-4	One of two branches into Hoboken Creek. Approximately 5.4 miles southwest of where it enters Big	TP, OP, & TSS samples taken using Van Dorn sampler, level taken with tape measure at reference point on culvert, DO & temperature taken at reference	Control Sites	TP, OP, TSS, DO, temperature, level, transparency

	Sauk Lake.	point with DO meter, transparency measurement made by transparency tube.		
Hob 5-2	One of two branches into Hoboken Creek. Approximately 5.4 miles southwest of where it enters Big Sauk Lake.	OP taken using Van Dorn sampler, level taken with tape measure at reference point on culvert, DO & temperature taken at reference point with DO meter, transparency measurement made by transparency tube.	Control Sites	OP, level, DO, temperature, transparency
Hob 3-3	Hoboken Creek approximately 3.3 miles southwest of its entrance into Big Sauk Lake. Changes from predominately agriculture to residential.	TP, OP, & TSS samples taken using Van Dorn sampler, level taken with tape measure at reference point on culvert, DO & temperature taken at reference point with DO meter, transparency measurement made by transparency tube.	Stream Impact Assessment Sites*	TP, OP, TSS, DO, temperature, level, transparency
Hob 0-8	Hoboken Creek approximately .8 miles before it enters Big Sauk Lake.	OP taken using Van Dorn sampler, level taken with tape measure at reference point on culvert, DO & temperature taken at reference point with DO meter, transparency measurement made by transparency tube.	Stream Impact Assessment Sites*	OP, level, DO, temperature, transparency
Sil 8-3	Silver Creek headwaters. Approximately 8.3 miles west of Big Sauk Lake.	TP, OP, & TSS samples taken using Van Dorn sampler, level taken with tape measure at reference point on culvert, DO & temperature taken at reference point with DO meter, transparency measurement made by transparency tube.	Control Sites	TP, OP, TSS, DO, temperature, level, transparency
Sil 6-5	Silver Creek approximately 6.5 miles from Big Sauk Lake.	OP taken using Van Dorn sampler, level taken with tape measure at reference point on culvert, DO & temperature taken at reference point with DO meter, transparency measurement made by transparency tube.	Stream Impact Assessment Sites*	OP, level, DO, temperature, transparency

\* SRWD currently has Control and Recovery sites on these stretches.

**Sampling site maps located in the appendix.**

**Site Specific Sampling:**

Parameters Monitored	Site #	Where In the Water Column?	Where Across Transect?
OP, DO, temperature, level, transparency	SR 14-5	Eight inches below the surface of the water unless too shallow, then halfway between surface and bottom.	In the mainstream current

TP, OP, TSS, DO, temperature, level, transparency	SR 10-6	Eight inches below the surface of the water unless too shallow, then halfway between surface and bottom.	In the mainstream current
TP, OP, TSS, DO, temperature, level, transparency	SR 6-4	Eight inches below the surface of the water unless too shallow, then halfway between surface and bottom.	In the mainstream current
OP, level, DO, temperature, transparency	SR 1-6	Eight inches below the surface of the water unless too shallow, then halfway between surface and bottom.	In the mainstream current
TP, OP, TSS, DO, temperature, level, transparency	Ash 14-4	Eight inches below the surface of the water unless too shallow, then halfway between surface and bottom.	In the mainstream current
OP, level, DO, temperature, transparency	Ash 9-0	Eight inches below the surface of the water unless too shallow, then halfway between surface and bottom.	In the mainstream current
TP, OP, TSS, DO, temperature, level, transparency	Hob 5-4	Eight inches below the surface of the water unless too shallow, then halfway between surface and bottom.	In the mainstream current
OP, level, DO, temperature, transparency	Hob 5-2	Eight inches below the surface of the water unless too shallow, then halfway between surface and bottom.	In the mainstream current
TP, OP, TSS, DO, temperature, level, transparency	Hob 3-3	Eight inches below the surface of the water unless too shallow, then halfway between surface and bottom.	In the mainstream current
OP, level, DO, temperature, transparency	Hob 0-8	Eight inches below the surface of the water unless too shallow, then halfway between surface and bottom.	In the mainstream current
TP, OP, TSS, DO, temperature, level, transparency	Sil 8-3	Eight inches below the surface of the water unless too shallow, then halfway between surface and bottom.	In the mainstream current
OP, level, DO, temperature, transparency	Sil 6-5	Eight inches below the surface of the water unless too shallow, then halfway between surface and bottom.	In the mainstream current

## Sampling Schedule

Parameter(s)	Frequency	Time of Day	Time of Year	# of Years	Special Weather Conditions
DO, temperature, level, OP, transparency	Twice per month	Between 9 a.m. and 11 a.m.	April-October	1+	Not a consideration
TP & TSS	Once per month and on rain events (max of 4) on specified locations	Between 9 a.m. and 11 a.m.	April-October	1+	

# Chapter 5: Quality Assurance / Quality Control

## Quality Control Measures

Quality Control Measures	Evaluation: Statistical Methods	Parameters and % Quality Control Samples				
		OP/TP	TSS	Transparency	DO/Temp	Bridge Downs
<b>Internal</b>						
Field Duplicates	RPD	10% of all sites	10% of all sites	75% of all sites	10% of all sites	75% of all sites
Calibration Standard	RPD	10% of all sites; OP may need more- we will revisit this issue				
Calibration Blank	RPD	10% of all sites			Once per run	
Laboratory Duplicate	RPD		10% of all sites			
<b>External</b>						
Unknowns	RPD		10% of all sites			
Split Samples	RPD		10% of all sites			

Response Action:

\*If a response action is needed, we will define the problem, determine the problem source, and resolve.

## Instrument and Equipment Requirements

**Equipment Type:** Transparency Tube

**Documentation:** Manufacturer's instruction manual

**Inspection and Frequency:** Prior to each sampling event

**Maintenance:** Check once a month for repairs

**Calibration Frequency:** N/A

**Reference Standards Used:** N/A

**Calibration Instrument Used:** N/A

**Equipment Type:** Portable DO Meter  
**Documentation:** Manufacturer's instruction manual  
**Inspection and Frequency:** Prior to each sampling event  
**Maintenance:** Check DO membrane prior to sampling  
**Calibration Frequency:** Prior to each sampling event  
**Reference Standards Used:** Deionized water  
**Calibration Instrument Used:** Will add in at time of purchase

**Equipment Type:** Colorimeter  
**Documentation:** Manufacturer's instruction manual  
**Inspection and Frequency:** Prior to each sampling event  
**Maintenance:** Check once a month for repairs  
**Calibration Frequency:** According to manufacturers instruction manual  
**Reference Standards Used:** Phosphate reagent  
**Calibration Instrument Used:** Will add in at time of purchase

**Equipment Type:** Tape Measure  
**Documentation:** Manufacturer's instruction manual  
**Inspection and Frequency:** Prior to each sampling event  
**Maintenance:** Clean once a season with baking soda and water  
**Calibration Frequency:** N/A  
**Reference Standards Used:** N/A  
**Calibration Instrument Used:** N/A

**Equipment Type:** Van Dorn  
**Documentation:** Manufacturer's instruction manual  
**Inspection and Frequency:** Prior to each sampling event  
**Maintenance:** Check prior to each sampling event; wash with baking soda and water in the fall  
**Calibration Frequency:** N/A  
**Reference Standards Used:** N/A  
**Calibration Instrument Used:** N/A

The SRWD Tech team will be responsible for maintaining and calibrating the equipment.

# Instructions, Documentation, Records and Manuals

## Instructions

SOP's will be needed for: the Van Dorn, Bridge down measurements, water sample collection, colorimeter equipment, DO meter, transparency tubes, and field note process.

The Sauk River Watershed District will house all SOP and QA/QC documents and will include these documents with the two volunteer kits before the monitoring season. Volunteers will also receive written instructions for all equipment and field processes, safety issues and field checklists at training sessions.

## Documentation and records

During each monitoring season, the Sauk River Watershed District will keep records on:

- Volunteer identification: name, address, interests, etc.
- Waivers
- Log of equipment/kit usage, calibrations, maintenance and repairs.
- Sample site lists, GPS and maps
- All field notes
- Lab services
- Data submittals

The information collected from volunteers will be added to our database (and is planned to be posted on our website once completed) in addition to a paper copy being kept for 10 years at the office after the close of any project area.

## Manuals used by volunteer monitors

Volunteers will have the opportunity to use the MN Pollution Control Agency's Volunteer Surface Water Monitoring Guide in addition to the SRWD's Volunteer Monitoring Guide handed out at the training sessions.

We plan to use DHIA Laboratories based in Sauk Centre for our certified lab work on total phosphorus and total suspended solids. The District has used this laboratory in the past and not only is it certified by the MDH, it has also been approved by the MPCA. DHIA's 95 page QA/QC report is on file at the District office.

## Training

Training Aspect	Description
The SRWD Annual "Care for Your Waters" Workshop	The SRWD will hold its annual training workshop on April 17 <sup>th</sup> , 2004, themed around stream monitoring and hosted near the monitoring locations in this plan to attract volunteers in the designated areas. Training will be for new and returning volunteers and although hosted by SRWD, we plan to also have presenters from: U of MN Extension and the MPCA Citizen Stream Monitoring Program. Sessions will include: background information on watersheds, the nuts and bolts of sampling, and training on the t-tube, grab samples, staff gauge readings, Van Dorn use, field note etiquette and QA/QC.
Field Day Training	The SRWD will make a private training available for people committing time to volunteer in the designated areas in this plan. All new and existing monitors will receive written instructions and a refresher course each year.

## Chapter 6: Data Storage and Management

### Data Management

Type of Sheet Field Sheet

- Site ID
- Date
- Time
- Monitor's Names
- Type of samples collected
- Results of field measurements
  - DO
  - Temperature
  - Level
  - Transparency
  - Duplicate samples
- Current weather conditions
- Precipitation within last 24 hours?
- Note if there is any quality control sample; i.e. duplicates/standards
- General visual observations

Type of Sheet Lab Data Sheet

- Name of lab
- Lab Code
- Date/Time sampled
- Date/Time received
- Site ID
- Contact/Phone
- Sampler
- Analysis Results, Method, Date
- Reporting limit of the analysis method
- Minimum detection limit
- Data proofer's signature
- Comments

### Handling of field and laboratory sheets and electronic data transfer

Name of Sheet Or Database	From Field to Lab	From Lab to Data Entry	Data Entry/Validation	Final Resting Place
Field Data Sheet	Field Sheets remain at the Watershed District Office where they are entered into a spreadsheet	n/a	Data entry will be done by Melissa	Field sheets will be filed in the monitoring file cabinet at the Watershed District (WD) Office

Chain of Custody (C of C)	Chain of Custody sheets accompany the samples to the lab where they are double checked for accountability.	A duplicate copy of the chain of custody will accompany the raw data when sent back to the office	Data entry will be done by Melissa	C of C sheets will be filed in the monitoring file cabinet at the WD Office along with the Field data and lab sheets
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## Meta-data

### PROJECT INFORMATION

Check Where Found:

Meta-data element	In the Plan	On Field Sheet	On Lab Sheet	In Computer Program	Other:
Project ID					
Project name	X	X	X	X	
Project purpose	X				
Start date	X				
Planned duration	X				
Lead organization name	X		X		
Project manager	X		X		
Sampling personnel	X	X	X		
Sample medium	X	X	X		
Sample collection methods	X	X			
Equipment Used	X	X			
Field measurement methods	X	X			
Project Study Area	X				
Design & sampling frequency	X				
Cooperating Org.:	X				
QA plan summary/reference	x				

### LABORATORY

Check Where Found:

Meta-data element	In the Plan	On Field Sheet	On Lab Sheet	In Computer Program	Other:
Lab ID	X		X		
Laboratory name (w/ address and contact info)	X		X		
Citation for lab (Manual or Handbook).					X
Parameter	X	X	X	X	
Sample fraction			X		

Reporting units	X		X	X	
Comparable standard method	X				X
Field preservation method	X	X			
Detection limit	X		X		
Lab certified for parameter?	X				X
Length of Analysis			X		

### STATION INFORMATION

Check Where Found:

Meta-data element	In the Plan	On Field Sheet	On Lab Sheet	In Computer Program	Other:
Project station ID	X	X			
Station name	X	X	X	X	
Station type	X	X			
Water body type (stream, lake, wetland)	X	X			
Station description	X	X			
Site ID	X	X	X	X	
Eco-region name	X				
Travel directions				X	
Station latitude-longitude or UTM				X	
Geo-positioning method				X	
Site lat-long				X	
State/county	X				
HUC code	X				
River Reach	X				

### MONITORING RESULTS

Check Where Found:

Meta-data element	In the Plan	On Field Sheet	On Lab Sheet	In Computer Program	Other:
Station and site ID	X	X	X	X	
Date		X	X	X	
Time		X	X		
Station ID	X	X	X		
Site ID	X	X	X	X	
Activity ID, type and category	X	X			
Sample depth	X	X			
Sampling personnel	X	X			
Activity comments		X		X	
Sample collection method and equipment	X	X			
Sample preservation	X				
Lab ID			X		X
Lab sample ID			X		X
Lab certified?	X				
Results			X	X	X
Field/lab ID	X		X		X
Remark codes			X		X

## Entering and validating data –

Parameter	Reporting Units Entered (e.g. mg/l, taxa, etc.)	Computer Application (s) Used for Data Entry	Who Will Enter Data	Validation Steps and Who
TP	Mg/L	Microsoft Excel	Melissa	Melissa will check computer entries against field and lab sheets
TSS	Mg/L	Microsoft Excel	Melissa	Melissa will check computer entries against field and lab sheets
OP	Mg/L	Microsoft Excel	Melissa	Melissa will check computer entries against field and lab sheets
Temperature	°F	Microsoft Excel	Melissa	Melissa will check computer entries against field and lab sheets
Dissolved Oxygen	Mg/L	Microsoft Excel	Melissa	Melissa will check computer entries against field and lab sheets
Transparency	Cm	Microsoft Excel	Melissa	Melissa will check computer entries against field and lab sheets
Level	Feet	Microsoft Excel	Melissa	Melissa will check computer entries against field and lab sheets

## Miscellaneous problem data

Parameter	Data Entry Protocol for "Problem" Data
TP	When there is less than the minimum detectable value of a parameter, values will be expressed as "less than" (<).
TSS	When there is less than the minimum detectable value of a parameter, values will be expressed as "less than" (<).

\*This list will be added to when additional miscellaneous or problem data occurs

# Chapter 7: Analysis, Interpretation, & Reporting

## Data Analysis – Summarizing and Comparing Data to Benchmarks and Interpretation

Parameter	Data User(s)	Statistical Summaries To Be Used	Types of Graphs	Benchmark Used	How Data Will Be Compared with Benchmark	How Comparison Will Be Interpreted
Ortho Phosphorus (OP)	SRWD Lake Assoc. Counties MPCA	Seasonal Average Seasonal Median Range Quartiles	Column, Combination Box & Whisker	<30% of Total Phosphorus *SRWD Monitoring Plan Goal	Compared to TP over time sampled. % exceedence over 30% of TP. #of samples exceeding over 30% of TP.	Is OP maintaining < 30% of TP throughout the season? <b>Full Support if % exceedence is less than 10% of samples.</b>
Total Phosphorus (TP)	SRWD Lake Assoc. Counties MPCA	Seasonal Average Seasonal Median Range Quartiles	Column, Combination Box & Whisker	Ecoregion Average (NCHF)	Compared to TSS, precip, and water levels over time sampled. Compared to ecoregion average (60-150 ug/L), % exceedence over ecoregion.	Did the levels of TP exceed ecoregion averages? <b>Full Support if % exceedence is less than 25% of samples.</b> <b>Otherwise potentially impaired.</b>
Total Suspended Solids (TSS)	SRWD Lake Assoc. Counties MPCA	Average (flow-weighted?) Median Range Quartiles	Column, Combination Box & Whisker	Ecoregion Average	Compared to precipitation and water level over time sampled. Compared to ecoregion seasonal average (4.8-16 mg/L), % exceedence over ecoregion.	Did the TSS levels exceed the ecoregion guidelines? <b>Full Support if % exceedence is less than 25% of samples.</b> <b>Otherwise potentially impaired.</b>
Temperature (temp)	SRWD Lake Assoc. Counties MPCA	Seasonal Average Seasonal Median Range Quartiles	Column, Combination Box & Whisker	Ecoregion Average	Compared to water level over time sampled. Compared to ecoregion seasonal average (2-21 degrees C).	Did the Temperature levels exceed the ecoregion guidelines? <b>Full Support if % exceedence is less than 25% of samples.</b> <b>Otherwise potentially impaired.</b>
Dissolved Oxygen (mg/L) (DO)	SRWD Lake Assoc. Counties MPCA	Seasonal Average Seasonal Median Max. & Min. Quartiles	Column, line, Combination Box & Whisker	Trend Analysis	Compared to water level, precipitation, temp, and TP over time sampled.	Compared to water level, precipitation, temperature, and TP over time sampled.

Transparency (T-tube)	SRWD Lake Assoc. Counties MPCA	Seasonal Average Seasonal Median Range Max. & Min. Quartiles	Column, Combination Box & Whisker	Trend Analysis	Compared to TP, TSS and precipitation over time sampled.	Compared to TP, TSS and precipitation over time sampled.
Water Level (BD =bridge down to water)	SRWD Lake Assoc. Counties MPCA	Daily Average (?) Seasonal Average Seasonal Median Range Max. & Min.	Column, line, Combination Box & Whisker	Trend Analysis	Compared to precipitation and time.	Compared to precip and time.

## ***Data Interpretation and Analysis***

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### **1) Developing findings**

- Are designated uses supported generally in the watershed?
- How do the results compare to ecoregion guidelines?
- Did the parameters analyzed exceed the maximum and minimal levels?
- If so, when, where and how often?
- Are there any "outliers" that will affect the overall data?
- Do the parameter levels show a consistent pattern?
- Does the pattern connect with another variable (i.e. precipitation)?
- Are there any transcribed errors?
- Do the field notes coincide with the data, (i.e. cold temps, rainfall, etc.)?
- Were the minimum amount of samples collected to make reliable assessments (no less than 8 data points)
- Were there any weather conditions/events when data exceeded benchmark?
- If so, what were the conditions, duration, etc?
- How do the results compare among monitoring sites?
- Do changes in one parameter coincide with the changes of another parameter?
  - Does TP correlated with TSS increase or decrease?
  - Does TP correlated with precipitation patterns?
  - Does TSS correlate with water levels and/or precipitation patterns?
  - Does temperature change correlate with water levels?

### **2) Developing conclusions**

The Watershed District will obtain diagnostic information on an individual stream basis, to determine which tributaries leading into the Sauk River have low water quality and to what degree. From the data collected we will be able to determine where potential pollutants are and gather sound data on whether BMP's implemented in the area are effective.

### **3) Reporting, Presenting, and Planning for Change**

The Sauk River Watershed District will be using the data in project related annual reports which are submitted to the MPCA. When relevant, the Watershed District will share the volunteer data with local and state organizations and agencies to supplement BMP plans. Presentations may include written reports, maps, charts, and PowerPoints. Information pertaining to volunteer efforts will be presented in the SRWD Annual Report which is given to State and Federal government, local agencies and citizens, as well as presented at county fairs and meetings. Further communication will include the annual Clearly Water volunteer monitor newsletter which is sent out each winter and contains information from the previous season's monitoring efforts.

<i>Data User/ Target Audience</i>	<i>Report Information Needed</i>
MPCA	Raw Data
SWCD	Summarized data and recommendations
Lake Associations/Local Reps.	Interpreted data and recommendations

The Tech team hopes that the data will be used to determine and possibly correct problem areas within the sub-watersheds. By sharing our information, we hope to reach a greater number of people through our communication lines.

## Chapter 8: Feedback & Evaluation

### 1) Follow-up:

<i>Group/Audience</i>	<i>How Follow-up will happen:</i>	<i>When follow-up will occur</i>
Volunteers	Contact via phone or in person mid sampling season.	July/August
Volunteers	Send newsletters out.	January/February
Volunteers	Follow up with volunteers on experience and needs.	January/February
Data users	Follow up to see if the data was used.	May
Data users	Phone call and confirm data request.	January- send previous season's data and get request for following season.

### 2) Evaluation

<i>Evaluations Done Annually (Program and/or Outcome Based Components)</i>	<i>Tools used for evaluation</i>
Is the monitoring meeting the District's goals?	Cross referencing results and goals
Did the data collected answer data user's questions?	Verbal correspondence
Has the vision of the plan changed?	Review vision
Were volunteers happy with the process?	Personal evaluations mailed out in November
How is the data management & analysis process?	Verbal evaluation with data processors
How is the equipment holding up?	Visual and check field notes
Is the data meeting our expectations?	Review of data

\* After the first year, SRWD will determine its long term evaluation methods

## Chapter 9: Volunteers, Tasks, Timelines

Target Date	Main Category (Planning, Mgt., Monitoring, Post- Monitoring)	Task / Activity Description	Person(s) Responsible to Organize/ Evaluate	Other Resources (human or financial) to Carry-Out Task	Fill in Date when done
November	Post Monitoring	Technical committee meeting-review last season and needed changes.	SRWD Monitoring Coordinator	N/A	
November	Management	Collect data and put in database/on website.	SRWD Monitoring Department	N/A	
November	Communication	Send "Thank You" to past season volunteers.	SRWD Monitoring Department	Need \$25	
Early January	Management	Technical committee meeting- review data, documentation and reporting.	SRWD Monitoring Coordinator	N/A	
Late January	Planning	Technical committee meeting-prepare for Spring volunteer workshop and new season.	SRWD Monitoring Coordinator	N/A	
January	Communication	Create and send annual "Clearly Waters" volunteer newsletters.	SRWD Education Department	Need \$1/newsletter	
Mid-February	Communication	Send invitations out for annual workshop.	SRWD Monitoring Department	Need \$100	
February	Planning	Technical committee meeting- determine necessary volunteer sites and bonus sites, new equipment, etc.	SRWD Monitoring Department	Technical reports; Partnering agency advice	
March	Management	Review list of volunteers and advertise for new members.	SRWD Monitoring Department	N/A	
Target Date	Main Category (Planning, Mgt., Monitoring, Post- Monitoring)	Task / Activity Description	Person(s) Responsible to Organize/ Evaluate	Other Resources (human or financial) to Carry-Out Task	Fill in Date when done
April	Training	Hold training session in mid-April.	SRWD Monitoring Department	\$800	
May	Communication	Contact volunteers by phone or mail to see if they have any questions.	SRWD Monitoring Department	\$25	
May-September	Communication	Have contact with volunteers as they come into the office to use the kits.	SRWD Monitoring Department	N/A	

## Volunteer Monitors (tentative) -

<b>NAME</b>	<b>NOTES</b>	<b>Address</b>	<b>Phone</b>
Bob Bjork	Big Sauk Lake Association President	44155 County Rd 24 Sauk Centre, MN 56378	320-351-2513
Gene Waldorf	Big Birch Lake Association President	30225 122 <sup>nd</sup> St Grey Eagle, Mn 56336	320-285-8867
Skip Manoski	Big Sauk Lake Association	41037 Sauk Lake Rd Sauk Centre, MN 56378	320-352-6838
Jerry Pogose	Osakis Lake Association	13227 Fawn Drive Osakis, MN 56360	320-859-2625
John Westereng	Osakis Lake Association	19357 Eastwood Drive Osakis, MN 56360	320-859-3218
Will recruit at the annual workshop and add at that time.			

## Committees and Data Users -

### **Committees**

<b>Name/Organization</b>	<b>Area of Expertise</b>	<b>Address</b>	<b>Phone</b>
Amy Trisko	SRWD staff Monitoring Coordinator	Sauk Centre	320-352-2231
Melissa Bromenshenkel	SRWD staff Monitoring Field Manager	Sauk Centre	320-352-2231
Bob Bjork	Area Chemist	Sauk Centre	320-351-2513
Gene Waldorf	Experienced Volunteer Monitor	Grey Eagle	320-285-8867
Jerry Pogose	Local Volunteer Monitor	Osakis	320-859-2625
SRWD Board Member	SRWD Political Official	Upper Sauk	320-352-2231

**Data Users**

<b>Name/Organization</b>	<b>Address</b>	<b>Phone</b>
Sauk River Watershed District	Sauk Centre	320-352-2231
Big Sauk Lake Association	Sauk Centre	320-351-2513
Osakis Lake Association	Osakis	320-859-3618
City of Sauk Centre	Sauk Centre	320-352-2203
MPCA	Brainerd	800-646-6247
MN DNR	Sauk Rapids	

## Chapter 10: Over-all Budget

### Revenues:

<i>Item</i>	<i>Description</i>	<i>Budget</i>	<i>Expected Revenue following Years</i>
RCM Grant	Workshop grant	\$3000	0
In-Kind SRWD		\$8,521	2,180
<b>TOTAL REVENUE</b>		<b>\$11,521</b>	<b>\$2,180</b>

### Expenses: \*Highlighted areas are what the grant will be funding.

<i>Type of Expense</i>	<i>(unit price)</i>	<i>Budget</i>	<i>Expected Costs following Years</i>
Presenter/training time	40*25	1000	1000
Training manuals	50	50	30
Facility Rental	100	100	100
Food and door prizes	350	350	350
Invitations/Communications	250	250	250
T-tubes	3@30	90	0
Tape measures	3@13	36	0
Rain gauges	3@10	30	0
Field tubs	2@7.50	15	0
Field books	2@10	20	0
Sample bottles	50	50	0
Mileage	1200miles*.375	450	450
Maps	10	10	0
DO Meter	2@600	1200	0
Van Dorn	1@60	60	0
Colorimeter	1@600	600	0
Stakes/poles	20	20	0
First aid kits	2@42	84	0
Staff gauges	2@25	50	0
SRWD Anchor Sites lab data	6000	6000	0
Volunteer Lab Costs	12 site*4runs of TP/TSS*\$22/run	1056	
<b>TOTAL EXPENSES 2004</b>		<b>\$11,521</b>	<b>\$2,180</b>

### In-Kind Contributions:

<i>Item</i>	<i>Description</i>	<i>Value</i>	<i>Expected Contribution the following Years</i>
Facility Rental	Training session	\$100	100
Food and door prizes	Training session	\$350	350
Invitations/Communications	3 written contacts before session	\$250	250
T-tubes	3/\$30	\$90	0
Tape measures	3/\$12	\$36	0
Rain gauges	3/\$10	\$30	0

Field tubs	15	15	0
Field books and manuals	70	70	30
Sample bottles	50	50	0
Mileage	1200*.375	450	450
Training time –agency's	40hrs*25	1000	1000
Maps	10	10	0
Stakes/Poles	20	20	0
Staff Gauge	2@25	50	0
4 sites lab samples	\$1,500/site	\$6,000	0
<b>TOTAL IN-KIND VALUE</b>		<b>\$8,521</b>	<b>2,180</b>

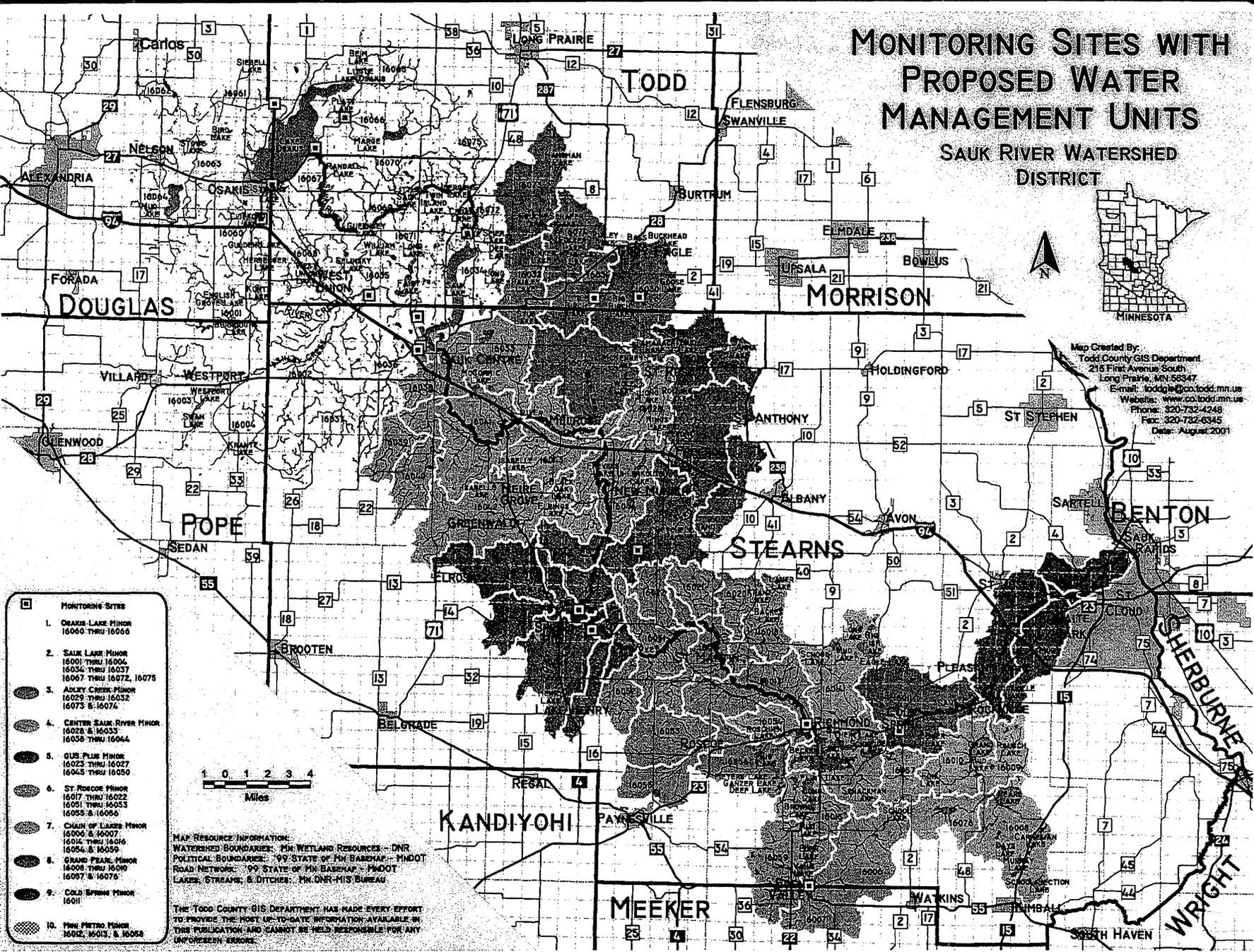
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# MONITORING SITES WITH PROPOSED WATER MANAGEMENT UNITS

## SAUK RIVER WATERSHED DISTRICT



Map Created By:  
 Todd County GIS Department  
 215 First Avenue South  
 Long Prairie, MN 56347  
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 Phone: 320-732-4748  
 Fax: 320-732-4345  
 Date: August 2001

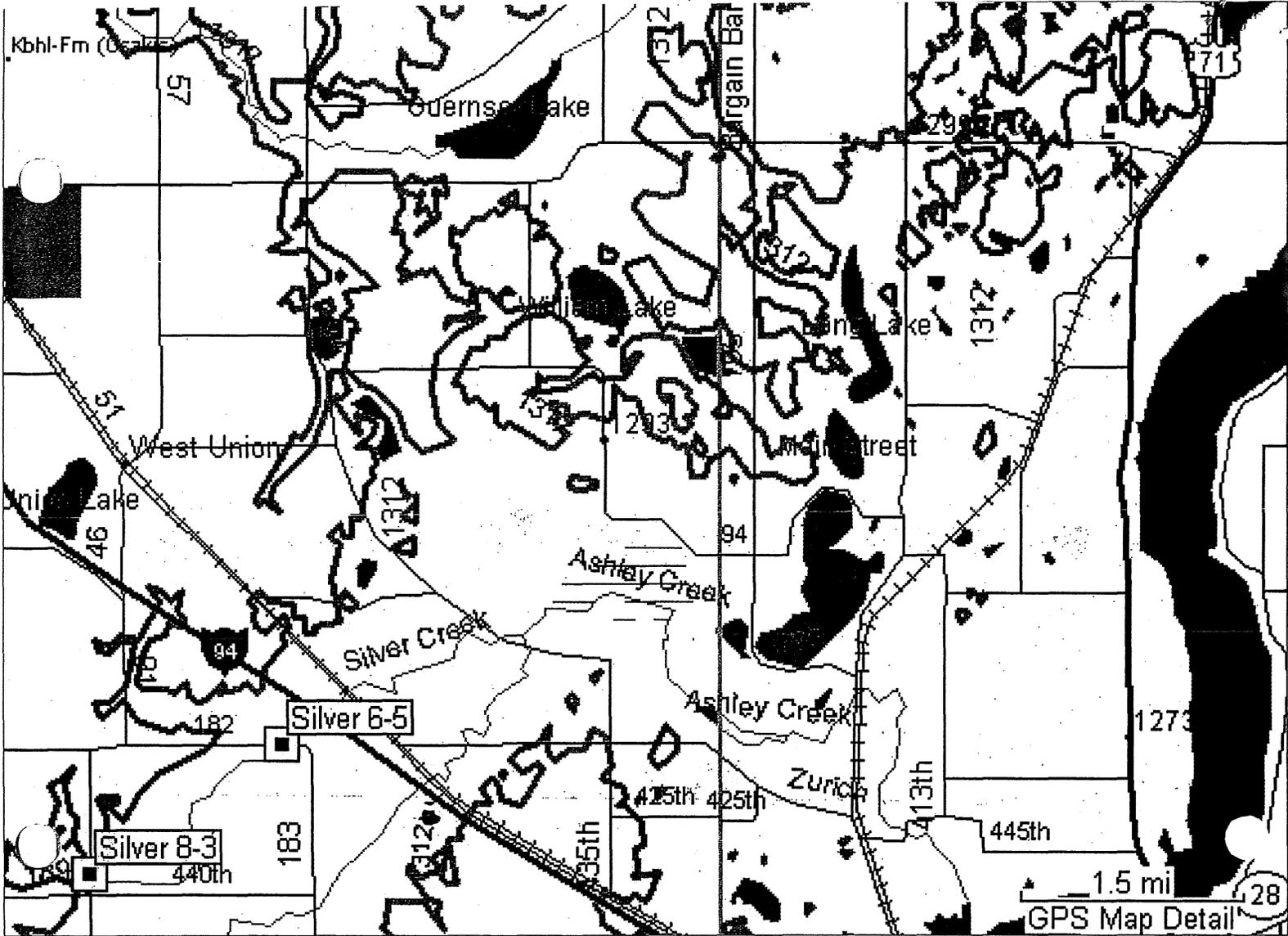


- MONITORING SITES**
1. OSAKIS LAKE MINOR  
16060 THRU 16066
  2. SAUK LAKE MINOR  
16001 THRU 16006  
16034 THRU 16037  
16067 THRU 16072, 16075
  3. ADLEY CREEK MINOR  
16029 THRU 16032  
16073 & 16074
  4. CENTER SAUK RIVER MINOR  
16028 & 16033  
16038 THRU 16044
  5. GUS PLUS MINOR  
16023 THRU 16027  
16045 THRU 16050
  6. ST. ROCOE MINOR  
16017 THRU 16022  
16051 THRU 16053  
16058 & 16068
  7. CHAIN OF LAKES MINOR  
16006 & 16007  
16014 THRU 16016  
16054 & 16059
  8. GRAND PEARL MINOR  
16008 THRU 16009  
16057 & 16076
  9. COLE SPRING MINOR  
16011
  10. MINI PETERO MINOR  
16012, 16013, & 16058



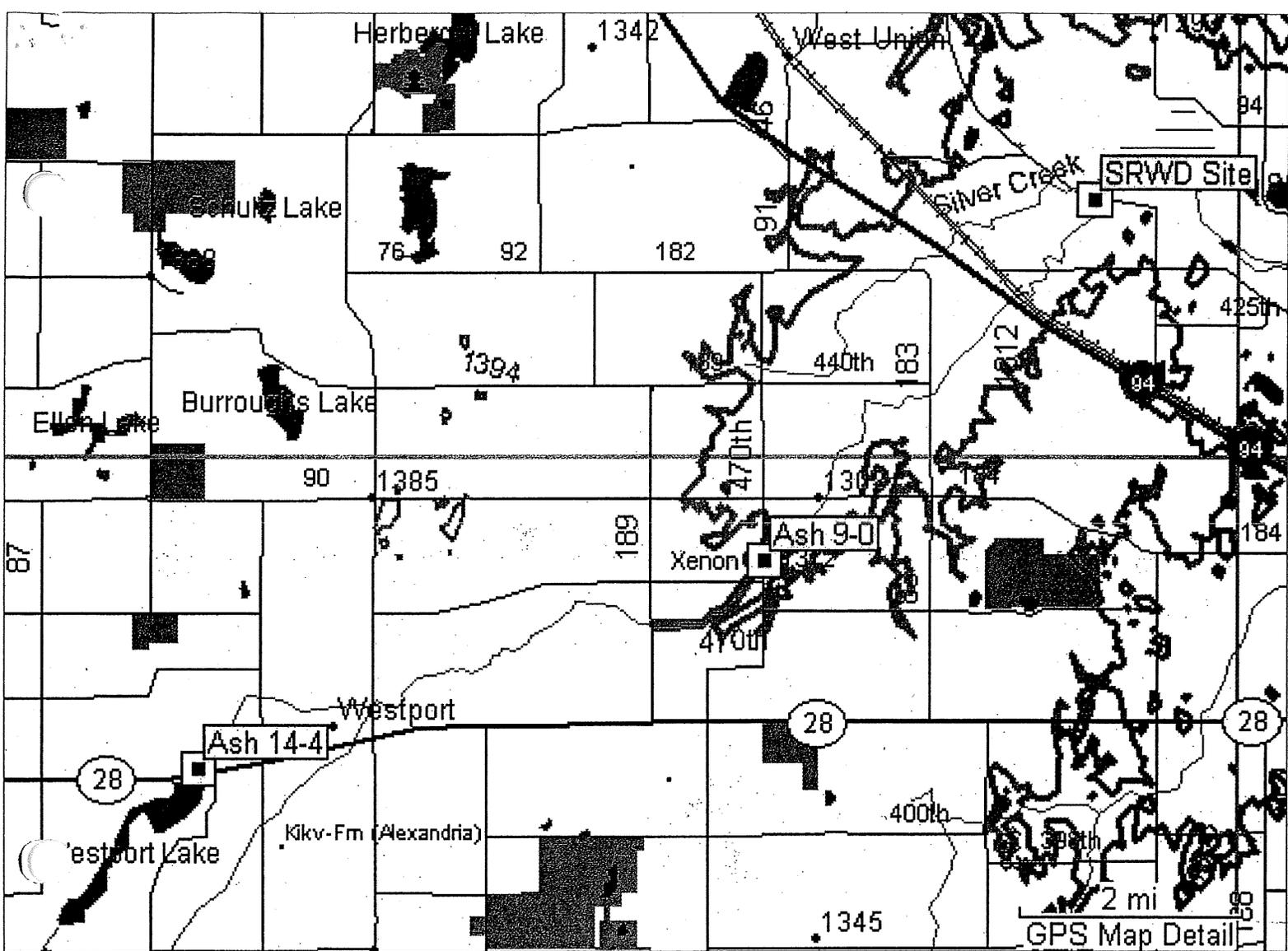
**MAP RESOURCE INFORMATION:**  
 WATERSHED BOUNDARIES: MN WETLAND RESOURCES - DNR  
 POLITICAL BOUNDARIES: '99 STATE OF MN BARRIAR - FMDOT  
 ROAD NETWORK: '99 STATE OF MN BARRIAR - FMDOT  
 LAKES, STREAMS, & DITCHES: MN DNR - HIS BUREAU

THE TODD COUNTY GIS DEPARTMENT HAS MADE EVERY EFFORT TO PROVIDE THE MOST UP-TO-DATE INFORMATION AVAILABLE IN THIS PUBLICATION AND CANNOT BE HELD RESPONSIBLE FOR ANY UNFORSEEN ERRORS.



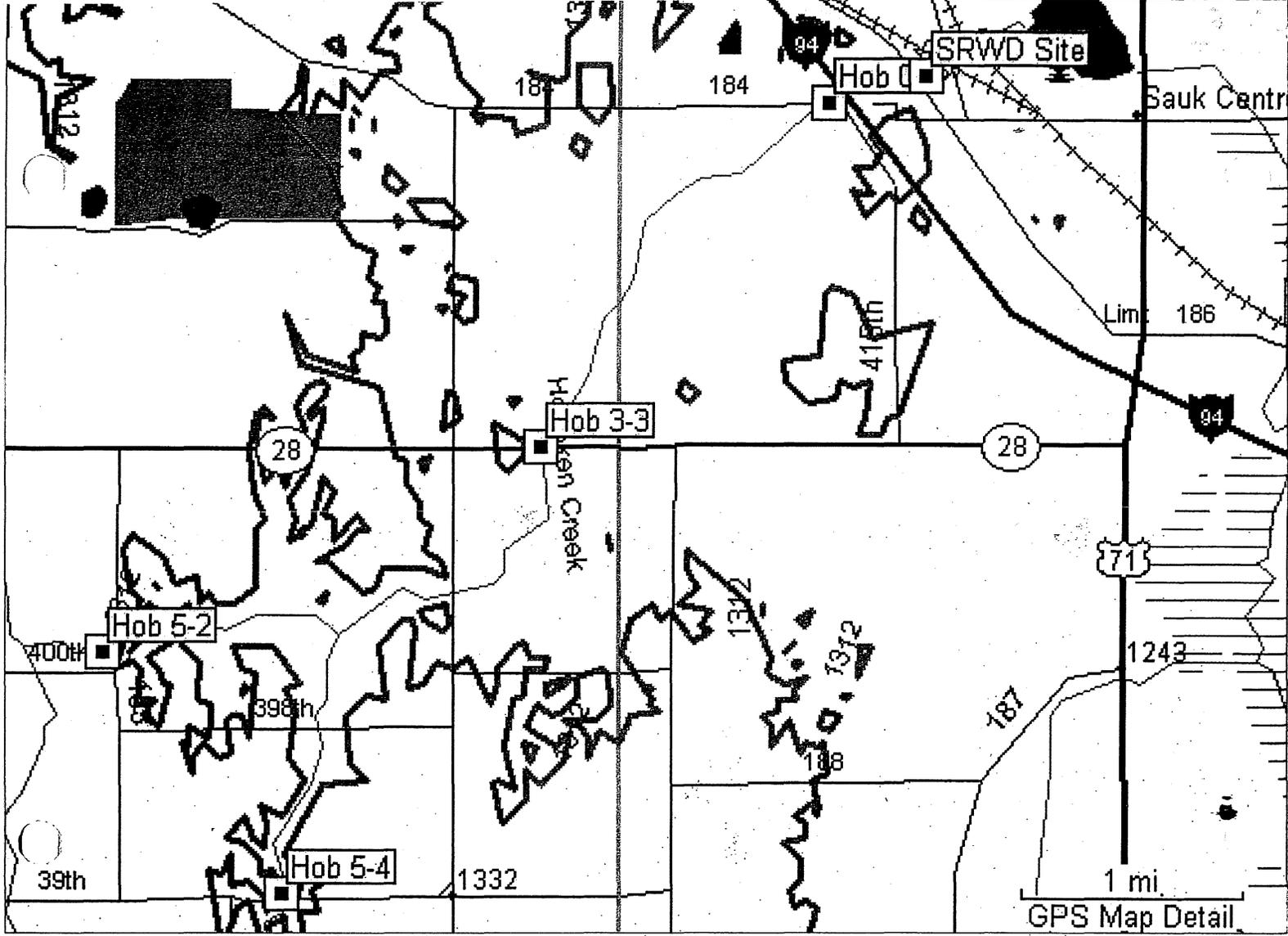
Silver Creek Volunteer Monitoring Sites

Silver 6-5	GPS Coordinates: N45 46.439 W95 03.690
Silver 8-3	GPS Coordinates: N45 45.681 W95 05.300



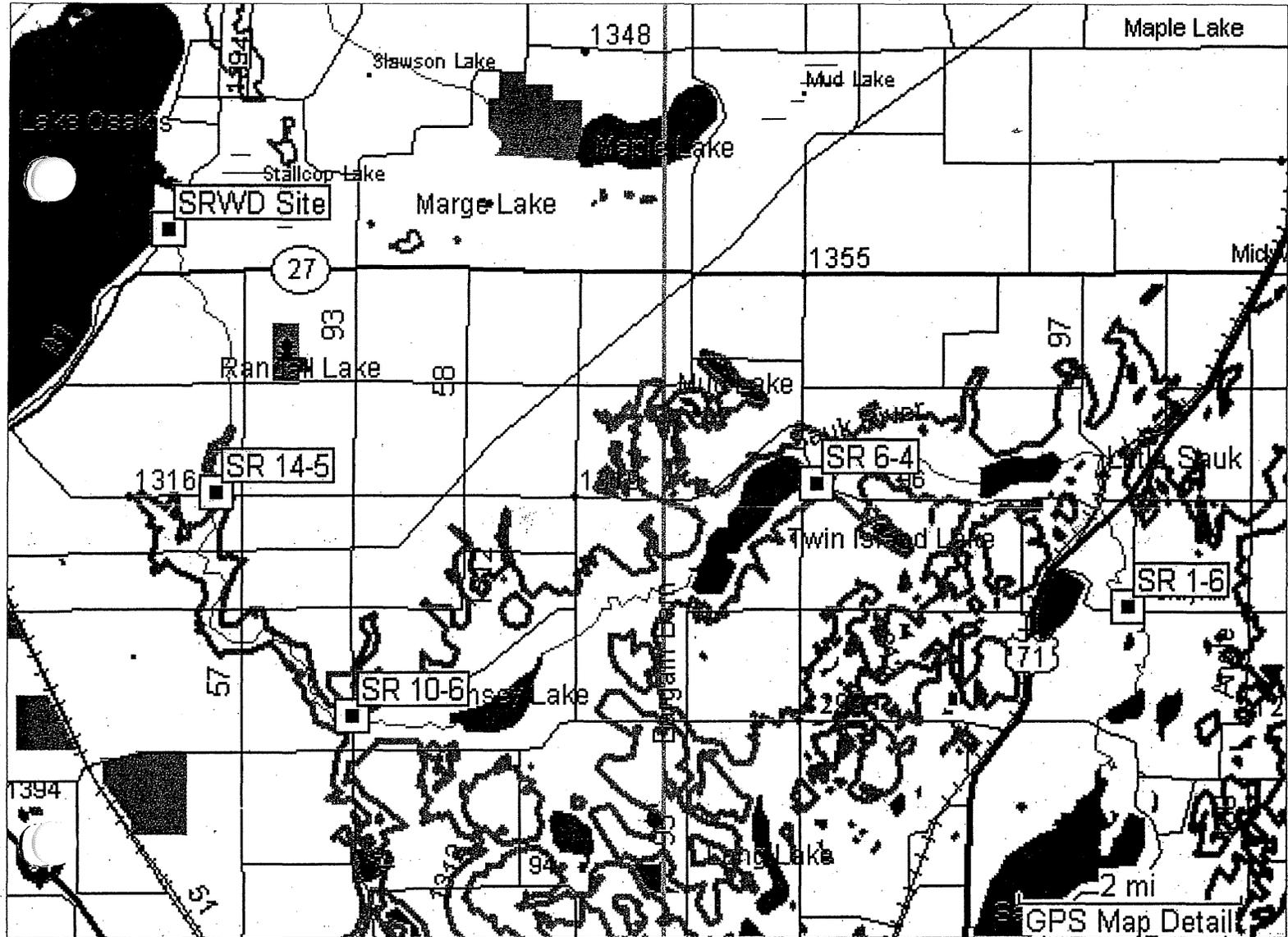
### Ashley Creek Volunteer Monitoring Sites

Ash 14-4	GPS Coordinates: N45 42.577 W95 11.545
Ash 9-0	GPS Coordinates: N45 44.188 W95 05.258
SRWD Site	GPS Coordinates: N45 46.979 W95 01.623



**Hoboken Creek Volunteer Monitoring Sites**

- Hob 0-8      GPS Coordinates: N45 44.289 W94 58.855
- Hob 3-3      GPS Coordinates: N45 42.960 W95 00.435
- Hob 5-2      GPS Coordinates: N45 42.167 W95 02.872
- Hob 5-4      GPS Coordinates: N45 41.230 W95 01.884
- SRWD Site   GPS Coordinates: N45 44.388 W94 58.318



Sauk River between Osakis & Sauk Lakes Volunteer Monitoring Sites

- SR 1-6      GPS Coordinates: N45 50.805 W94 54.809
- SR 10-6    GPS Coordinates: N45 49.960 W95 03.482
- SR 14-5    GPS Coordinates: N45 51.697 W95 05.012
- SR 6-4     GPS Coordinates: N45 51.774 W94 58.289
- SRWD Site GPS Coordinates: N45 53.728 W95 05.568