

Appendix A: Past Accomplishments of Water Plan 1997-2005

Surface Water Quality:

- Dead Livestock Collection Cost Share Program
- Sediment Survey Project
- Stream monitoring for Thief, Moose and Mud Rivers
- Stream monitoring for the Middle, Snake, and Tamarac Rivers
- Tamarac River Obstruction Removal Project
- Tile Drainage Monitoring
- Water Quality Training

Groundwater:

- Well Water Screening Clinics
- Well Sealing Cost Share Program
- County Abandoned and Drilled Well Inventories

Administration

- Feedlot Program
- Feedlot Inventory
- ISTS Ordinance Adopted 1998
- ISTS Administration, Zoning and Training
- Homeowners Septic Seminars
- Floodplain Ordinance Administration, Zoning and Training
- Shoreland Ordinance Administration, Zoning and Training
- Wetland Management Program
- Wetland Delineation Training
- Wetland Inventory Work for Thief River Watershed

Planning/Coordination:

- Comprehensive Land Use Plan Adopted 2000
- AgBMP Programs consolidated
- Board of Adjustment created
- Partnerships Created with Other Counties:
 - Job Share Water Planner and Feedlot Officer with Pennington County
 - Mentoring for ISTS Certification with Polk County
 - Educational Activities
- 1998 State Water Planners Conference coordinated
- NW MN Drainage Workshop 1999 coordinated

Education:

- Envirothon, Science Museum Presentation, Water Festival,
- Newsletters, Brochures, Public Information mailings
- River Watch Teacher Training

Appendix A: Past Accomplishments 2006-2010

Priority Concern 1:

SOIL EROSION CAUSING WATER QUALITY IMPAIRMENTS TO SURFACE WATERS OF THE COUNTY

Goal 1: Address high concentration of Sediment Affecting Water Quality in Snake River.

Objective A: To understand sources of sediment being deposited into Snake River

1. Conduct sediment surveys of waterways and ditches.
No action.
2. Continue stream monitoring for water quality in Snake River.
Action: 2006 County funded condition water quality monitoring of 6 sites by County Water Planner, using field and chemical analysis. 2006-2010; condition monitoring by River Watch, using field analysis and Red River Water Management Board (RRWMB), using field and chemical analysis.
Other Stream Monitoring: Tamarac Watershed
Florian Reservoir water quality monitoring began in 2008 using County funds with monitoring for phosphorus, chlorophyll-a transparency of water by the County Water Planner. Monitoring continued when a State Surface Water Assessment Grant funded monitoring in 2010 for nutrients of the Florian Reservoir as well as for 2009-2010 monitoring of Tamarac River for nutrients.
3. Obtain necessary agreements to perform water quality monitoring on private land, state, or federal land.
Action: Ongoing when necessary.
4. Review water quality data from all agencies to identify potential problem areas.
Action: Ongoing with County Water Planner, Water Quality Team/ Minnesota Pollution Control Agency (MPCA), Middle-Snake-Tamarac Rivers Watershed District (MSTRWD), and the RRWMB
5. Submit County water quality data to STORET Data Base.
Action: Ongoing all agencies doing water quality monitoring.

Objective B: To understand the operation of the impoundments in the Snake River Watershed

1. The WRAC shall form a task force to study the operation of the impoundments in the Snake River Watershed, meet with management, review and discuss operations.
No action.
2. The task force will make recommendations for change to decrease the negative impacts on water quality, if any exists.
No action.

Objective C: To reduce the sediment loads into the Snake River.

1. Promote best management practices through various programs.

Action: Marshall Soil Water Conservation District (SWCD) sent 23,800 newsletters to landowners providing information on CRP, CCRP, EQIP, CSP, RIM WRP, WHIP, State cost-share program and the process for sign-up.

2. Promote grassed filter strips and buffers in key erosion areas.
Action: Marshall SWCD and Minnesota Board of Water Soil Resources (BWSR) approved an application for a perpetual RIM easement in Section 3 of Swift Coulee in McCrea Township. Native grasses will be planted on 1320 linear feet x 240 feet.
3. Participate with Total Maximum Daily Load (TMDL) Study of Snake River.
Action: Study will begin 2012.
4. Education on natural resource protection through publications, and educational events.
Action: Agencies of MSTRWD, Marshall County, Marshall SWCD, Natural Resources Conservation Services (NRCS), Minnesota Department of Natural Resources (DNR) and agencies on Marshall County Water Resources Advisory Committee gave input on problems and solutions to Snake River water quality during the update process of the MSTRWD 10-Year Plan. Annual Envirothon and Water Festivals are held to educate elementary and high school students with most agencies assisting at these events. County Water Planner mailed about 1000 land use brochures to Marshall County property owners.
5. Implement cost share projects that reduce sediment load.
Action: Specific projects will be employed when TMDL study is initiated.
Other: Reduction of Sediment loads in Middle River
A cost-share stream bank stabilization project between County Water Planner and the County Hwy Dept was implemented along both sides of County Ditch 13 entering Middle River between sections one and two of Bloomer Township. Project included replacement of the driveway bridge with box culverts, re-grading the ditch, and installing two rock check structures, installing filter cloth and planting a grass mix.
6. Promote protection of riparian areas through Shoreland Permit Program.
Action: The County Water Planner/Zoning Administrator has conducted site visits, interpreted ordinance regulations to preserve the shore land and issued 25 permits.

Goal 2: Protect Soil Resources from Wind Erosion

Objective A: Seek and Utilize Funding Sources to implement Best Management Projects.

1. Increase wind break plantings.
Action:
A. A cost-share riparian wind break/buffer project between County Water Planner, Marshall SWCD and landowner was implemented in section 9 of Boxville Township along the Snake River. 1025 trees and bushes were planted in

rows along approximately 2000 feet of shore line. Soil savings from wind erosion is estimated at 615 tons per year.

B. Marshall SWCD implemented 142 district plantings consisting of 166,125 trees in 2006-2011. 650 Marshall County landowners purchased trees for private plantings to reduce wind erosion.

C. Marshall-Beltrami SWCD implemented windbreaks:

Year 2006- M-B SWCD installed 8.3 acres of shelterbelt trees in 2 sites located in Valley Township, and one located in Moylan Township.

Year 2007- M-B SWCD installed 7.2 acres of shelterbelt trees in two sites located in Eckvoll and Grand Plain Townships

Year 2009- M-B SWCD installed 3 acres of shelterbelt trees on two sites in located in Thief Lake Township and Rollis Township (estimated soil reduction loss was 1.7 tons per year).

2. **Identify and promote erosion prevention practices.**

Action:

A. A cost-share stream bank protection project between County Water Planner, U.S. WHIP Program, Marshall SWCD and landowner was implemented in Section 20 of Spruce Valley Twp. A field border of 4011 trees and shrubs and a quantity of grasses were planted. Pollution reduction was estimated at 9.18 lbs per year of phosphorus, 2.97 tons per year of sediment, and an estimated savings of 3.74 tons per year of soil.

B. A cost-share riparian buffer project between County Water Planner, MSTRWD, Marshall SWCD and BWSR was implemented along south side of State Ditch 3 (Middle River) in Sections 1 and 2 of Big Woods and 4 and 6 of Bloomer Townships. Five miles length and about 16.5' width of native grasses were planted.

C. Residue management implemented with the EQIP Program by NRCS resulted in 12,866 acres using no-till/mulch till practices in Marshall County.

D. A nature site was developed in 2008 along the Tamarac River by the Marshall County Water Planner and Marshall SWCD to reduce sediment run-off into a flood plain/wetland area by reducing non-native invasive species, maintaining existing native plants and inter-seeding additional native plants for purposes of a filter strip.

3. **Implement education for landowners and developers on erosion control plans.**

Action: County Zoning Administrator assisted 21 permits with review or development of erosion control plans for projects in riparian areas under County Shoreland Ordinance.

4. **Promote use of Agricultural Best Management Practices (AgBMP) Loan program to implement best management practices.**

Action:

A. M-B SWCD sent out 5,500 newsletters to landowners from 2006 to 2009 that included application information and details on the Agricultural Best Management Practices Loan Program.

B. Low interest Loans amounting to about \$1,792,240, were issued in 2006-2010 for conservation tillage equipment using a revolving loan account and new dollars from the State's Agricultural Best Management Practices (Ag BMP) Loan Program.

5. Promote and adopt a Soils Loss Ordinance.
No action.

Goal 3: Address High Volume of Sedimentation affecting water quality in Thief River.

Objective A: To understand sources of sediment deposited into Thief River.

1. Continue water quality monitoring of Mud, Moose and Thief Rivers.
Action: In 2007-2009, water quality monitoring was conducted for 10 sites by the Red Lake Watershed District (RLWD), and 7 sites by the Marshall Water Planner and M-B SWCD from April through September under the Thief River Watershed Sediment Investigation Grant.
2. Support intensive monitoring of input and output of waters going through impoundments.
Action: The United States Fish and Wildlife Service (Agassiz National Wildlife Refuge) partnered with the United States Geological Survey and the Red Lake Watershed District to conduct an intensive water quality study in and around Agassiz NWR. The study included intensive sampling, continuous flow monitoring, continuous water quality monitoring, and sediment fingerprinting. Agassiz NWR contributed 3-years work into the field investigation examining Refuge inflows and outflows.
3. Continue sediment surveys of waterways and ditches.
Action: The Marshall SWCD, Red River Technical Service Area 1, County Water Planner, RLWD and NRCS are continuously identifying erosion sites by windshield surveys. The Marshall SWCD and Red River Technical Service Area 1 identified 7 sites along the Mud River in Eckvoll Township, 2 sites along Jurisdictional Ditch (JD) branch into Mud River, 1 site on JD Branch into Mud River in Valley Township, and 1 site along JD in Eckvoll Township.
4. Form a task force to gain better understanding of Thief River watershed impoundment operations.
No action.
5. Review water quality data and studies of the Thief River Watershed.
Action: The Marshall County Water Planner has been involved with meetings held at the RLWD office regarding Thief River water quality studies and project planning. The Thief River Watershed Sediment Investigation was completed in 2009. Along with that project, a SWAT modeling report for the Thief River watershed was also produced.

Objective B: Reduce Sediment loads into the Thief River.

1. Promote grassed filter strips and buffers adjacent to ditches and key erosion areas.

Action:

A. In year 2011, the Marshall SWCD, NRCS and RLWD mailed out 21 letters to landowners within two miles of the Thief River between Thief Lake Wildlife Management Area (WMA) and Agassiz NWR. A meeting was held to discuss areas of concern, and erosion control programs/practices. 6 landowners have signed up for Continuous CRP for field buffer and side water inlets.

B. In year 2011, the Marshall SWCD and NRCS sent out three letters to landowners concerning erosion problems along the Mud River. One landowner is interested in using EQIP install 4 side-water inlets.

C. In year 2011, Marshall SWCD identified two other sites of erosion in Eckvoll and Valley Township. Landowners will be contacted.

D. In 2010, Marshall SWCD contacted 1 landowner about placing three side-water inlets in Valley Township. Landowner was interested but no practices were implemented.

2. **Promote CSP program.**

Action: M-B SWCD sent out information in newsletters to 1,100 landowners in district promoting and providing information about CSP Program. A meeting was hosted at Grygla Community Center for NRCS to provide information to landowners on the program. Information was given out through phone calls and referrals given to NRCS.

3. **Participate with TMDL studies of impairments to the Thief River.**

Action: A watershed-based TMDL study began in 2011 with RLWD directing the study. Stakeholder meetings were held and water quality monitoring began with RLWD, County Water Planner and Marshall SWCD participating in the monitoring of 7 sites.

4. **Implement cost share projects that reduce sediment load into ditches and streams.**

Action:

A. A cost-share grade stabilization project between the Water Planner, RLWD, Marshall SWCD and landowner was implemented in section 9 of Excel Strip. The erosion control project consisted of adding drainage pipe structure, rip rap, seeding and mulching. Estimated water pollution reduction is 100 tons per year of sediment.

B. In 2008, M-B SWCD assisted with the installation of 9 side-water inlets along Hwy 54 in Espelie Township. Estimated soil reduction loss was 90 tons per year.

C. In 2009, M-B SWCD assisted with installation of one culvert replacement in Whiteford Township utilizing Marshall County Con-Con funds. Ten side-water inlets were installed for two different landowners in Valley Township. The estimated soil loss reduction was 40 tons per year.

D. In 2011, Marshall County Hwy Dept. installed several rock chutes and riprap along Hwy 54 to reduce gully erosion from previous highway projects and damage caused by excessive rain events.

E. In 2011, the RLWD received a BWSR Clean Water Fund grant to construct grade stabilization structures in the lower 2.5 miles of Marshall County Ditch 20. This project also includes stream bank stabilization and side water inlet installation.

- F. Agassiz NWR has been working on repairing Ditch 11, downstream of the radial gates outlet of Agassiz Pool. This project will reduce the amount of erosion occurring in that ditch downstream of the outlet structure.
5. Promote protection of riparian areas through Shoreland Permit Program.
Action: The County Zoning Administrator has conducted property site visits; interpreted County's Shoreland Ordinance to preserve the shore land and issued 4 permits.

Priority Concern 2:

PROTECT GROUNDWATER-BASED DRINKING WATER RESOURCES

Goal 1: Protect Groundwater through Education and Monitoring Programs

Objective A: Develop education programs about groundwater supplies

1. Provide technical data for Wellhead Protection Plans
Action: The County Water Plan has assisted Marshall-Polk Rural Water, the City of Thief River Falls and the City of Viking with completion of their Wellhead Protection Plans. Assistance for the Wellhead Protection plans will be given in 2011 for City of Argyle and Marshall-Polk Rural Water.
2. Educate citizens on Drinking Water Supply Management Areas (DWSMA).
 No Action:
3. Educate the WRAC and citizens about groundwater through the use of speakers and written materials.
Action: In 2007, the County Water Planner sponsored a Groundwater Symposium with three professional speakers from MN Dept. of Health, MN Dept of Natural Resources and US Geological Survey for agencies and the public to attend in Middle River.

Objective B: Track Ground Water Quality

1. Develop and implement GPS program for locating drilled wells.
 No action.
2. Develop groundwater data base of these wells.
 No action.
3. Monitor domestic water wells by conducting Well Screen Clinics and distributing well water test kits.
Action: 2006 Well Screen Clinic was held by Marshall County Water Planner and M-B SWCD. The results were 27 participants from Grygla site and 44 participants from Newfolden site. About 50 well water test kits are distributed annually to landowners seeking to utilize RMB Environmental Laboratories for chemical analysis of their well water.
4. *Maintain Well Drilling and Sealing logs. Implement well searches.*
Action: Well logs are maintained in the County Water and Land office, location of sealed wells entered into BWSR's eLINK reports and searches for unsealed and drilled wells are made for landowners from County archives and Dept of Health's online County Well Index.

Objective C: Monitor Groundwater Levels

1. Pursue additional monitoring wells to be drilled in eastern Marshall County.

Action: Contact was made with DNR Observation Well Management. The opportunity for 2-3 additional wells to be drilled exists. Location may be considered for Eastern area of the County in areas of sand or gravel. Location, reason for monitoring static water levels, and determination of who will partner with DNR using in-kind labor will be decided.

Goal 2: Implement Mitigation Programs to Reduce Risk of Groundwater Contamination

Objective A: Continue Well Sealing Program.

Action: From 2006-2010, the County's Water Plan has administered the annual 75/25 cost-share program for sealing abandoned wells which has resulted in 37 wells sealed for \$17,345. 180 wells have been sealed since the program was started in 1992

Objective B: Update, Assist with, and Support other Mitigation Programs

1. Obtain from MPCA and maintain list of underground storage tanks in County.

No action.

2. Review mitigation plans for chemical spills in County.

Action: Hazardous Materials Response Capabilities instructions are located in the Marshall County-Wide Emergency Operation Plan, Annex L, Pages L (B)-3 and L (B)-4. This plan is located in the Marshall County Emergency Management Office. These pages are also stored in the Land Use Files of the Water and Land Office.

3. Support Solid Waste Program.

Action: Marshall County Solid Waste Department's Solid Waste Management Plan includes an ongoing recycling program for drop off collection of recyclable materials, Household Hazardous Waste collection program, Demolition and Mixed Municipal Solid Waste disposal facilities and ongoing education and promotion of proper management of waste materials.

4. Continue Dead Livestock Collection Program.

Action: In years 2006-2007 the cost share project of dead livestock collection for Marshall County resulted in a collection of 65 animals weighing 32,600 pounds. The project was cancelled in 2008 due to the outbreak in bovine Tuberculosis.

Other Mitigation:

A. 2006- M-B SWCD assisted with installation of two new wells for cattle operations under Disaster Assistance Program. These wells were installed in Valley Township for replacement of stock ponds.

B. As a result of the Feedlot Program, Marshall County developed a Feedlot Ordinance that regulates feedlots over 500 animal units with regard to manure management and water quality. Through the feedlot rules, we've developed manure management plans with feedlot procedures as inspection occurs. Plans are required for all lots over 100 animal units.

Objective C: Promote use of AgBMP Loan Program for Groundwater Protection Projects

1. Submit news releases on the loan program for well sealing, failing septic systems and feedlot run-off.
Action: Ongoing annual submission of press releases promoting use of low interest AgBMP Loans from the Department of Agriculture.

Priority Concern 3:

FLOOD DAMAGE REDUCTION TO PRESERVE AGRICULTURAL LAND AND TO PREVENT DAMAGE TO PROPERTY

Goal 1: Address function of ditch systems for adequacy of meeting drainage needs

Objective A: Improve ditch management and maintenance

1. Coordinate a ditch management workshop.
No action.
2. Develop a detailed jurisdictional map on ditches and coulees.
Action: The County highway department has updated their County ditch maps. The MSTRWD' drainage maps were developed by Houston Engineering, Inc.
3. Seek financial resources to fund ditch inventory for Middle, Snake and Tamarac Rivers Watershed.
Action: The MSTRWD received a \$20,000 BWSR sponsored grant to fund a ditch inventory and maintenance project. Houston Engineering, Inc. was contracted to provide technical assistance. Since completion of the objective, the data found on District's website has been significantly improved. The work was completed in February 2011.
4. Provide education to public on ditch maintenance.
No action:

Goal 2: Promote Flood Damage Reduction

Objective A: Review Flood Damage Reduction Workgroup Agreement

1. Develop a task force from Water Resources Advisory Committee (WRAC) to review and understand impoundment operations.
No action.
2. Compile inventory of flood damages from previous floods.
No action.

Objective B: Assist landowners with Flood Damage Control Projects

1. Implement Beaver Control Projects.
Action: Ongoing removal of beavers and beaver dams.
2. Assist landowners with technical and financial assistance for projects that reduce flooding.
Action: The MSTRWD has worked with the Red River Water Management Board, the Natural Resources Conservation Service and the Minnesota Department of Natural Resources to construct farmstead ring dikes to prevent floodwater damages. Since 2006 there have been 18 dikes built with 4 of that number being

EQIP dikes. The District, thru its permit program, provides technical assistance and sometimes can offer surveying work for permits which can be designed to reduce flood damages.

Objective C: Prevent property damage caused by flooding

1. **Administer Floodplain Management Ordinance.**
Action: The County's Zoning Administrator keeps informed on the interpretations of the Marshall County Floodplain Management Ordinance and administers the regulations to keep the public safe from flood hazard areas. The administrator is a nationally certified floodplain manager.
2. **Give technical assistance for projects requiring Floodplain permits.**
Action: Technical assistance was given to 656 contacts with site visits, floodplain determinations, planning assistance, public hearing assistance for conditional use permits and variances, interpretation of floodplain regulations, calculations of the regulatory floodplain protection elevations for buildings and by issuing 27 floodplain permits for building and land alterations in the floodplain.

Goal 3: Improve communication between the watershed districts and County.

Objective A: Report on status of flood control projects.

1. **County Board seeks representation on Project Work Teams with watershed districts.**
Action: County Board members Curtis Carlson and Leroy Vonasek have been active participants in the Agassiz Valley Water Resource Management Project Work Team and the Swift Coulee Project Work Team.
2. **Improve information exchange on watershed projects by sharing current reports.**
Action: The MSTRWD Administrator has met with the County Board during their Board Meetings. Commissioners Curtis Carlson and Leroy Vonasek have attended the District's Board Meetings. The District's Administrator periodically sends correspondence concerning District updates to county commissioners within the watershed district and the Advisory Committee.
3. **Coordinate professional speakers to give education on watershed management.**
Action: During the winter of 2010 the MSTRWD invited an attorney trained in drainage law, to attend a meeting for a group of landowners to discuss issues of drainage.

Appendix B: Wind Erodibility Soil Groups in Marshall County
Soil Survey of Marshall County, Part 11, pages 161-170

Extremely Susceptible

Group 1

148.

Group 2

66, 116, 117, 145, 187, 205, 242B, **258B**, 372, **426**, 482, 514, 540, 543, 544, 546, 547, 550, 563, **565**, 630, 647, 649, 708, 721B, 794, Udipsamments, **1264**, 1874, 1878, Berner, Hamar

Very Susceptible

Group 3

59, 77, 111, 280, 412, 435, 439, 481, 583, 643, 645, 650, 651, 713, Kratka, 1297, 1299, 1304A, 1304B, 1315A, 1882, Strathcona, 1966

Group 4

57A, 157A, 157B, 429A, 641, 644, Fargo, Northcote, 1871, 1964

Group 4L

47, 67A, 67B, 93A, 184A, 379, 383, 384, 418, 432, 582, 652, 935, 936, 937, 972, Vallers, 1158, 1170, 1963, Colvin, 1964

Susceptible

Group 5

58, 643, 765, 936, 1006

Group 6

Haploborolls, 1189

Group 7

None

Group 8

1031, 1146, 1187, 1188, 1804, 1807, 1818

Appendix C: Impoundments Impacting Marshall County

Snake River Watershed

PL 566 Off-Channel Storage
Angus-Oslo #1 located in Polk County
Angus-Oslo # 4 located in Polk County
Future Agassiz Valley WRM Project

Tamarac River Watershed

East Park
Nelson slough
Florian Reservoir

Thief River Watershed

Thief Lake
Eckvoll
Lost River Pool
Moose River North Pool
Moose River-South Pool
Agassiz Pool
Dahl Pool
East Pool
Farnes Pool
Small Pools (6)
Headquarters Pool
Kelly Pool
Lower CCC
Middle CCC
Mud River Pool
Madsen Pool
Northwest Pool
Parker Pool
Pool 8
Pool 21
South Pool
Tamarack Pool
Thief Bay Pool
Upper Middle CCC
Upper Mud River Pool
Webster

Appendix D: Source Water Protection - Assessment Plans

Name	ID	Assessment Plan	Aquifer Sensitivity Protection	Address	City
Alma Lutheran Church	5450031	-	<u>High</u>	County Road 19 and 1	Alma Township
Alvarado	1450001				Alvarado
Argyle	1450002	<u>completed</u>	<u>High</u>	City Hall	Argyle
Bethania Free Lutheran Church	5450022	-	<u>High</u>	7 miles west of town & 3/4 mile of CR 28	Newfolden
Gatzke Senior Center and Post Office	5450032	-	<u>High</u>		Gatzke
Grygla	1450003	-	<u>High</u>		Grygla
Holt	1450013	-	<u>High</u>		Holt
Kittson-Marshall Rural Water System	1450004	<u>completed</u>	-	Box 207	Donaldson
Marshall-Polk Rural Water System	1450005	<u>completed</u>	-	401 North Main	Warren
Middle River	1450006	-	<u>Low</u>		Middle River
Newfolden	1450007	-	<u>High</u>	Route 2, Box 31	Newfolden
Old Mill State Park	5450051	-	<u>Low</u>	County Road 4	Argyle
Oslo	1450008			Box 187	Oslo
Our Saviors Lutheran Church	5450034	-	<u>High</u>	County Road 49	Thief Lake
Silver Creek Lutheran Church	5450049	-	<u>High</u>	County Roads 12 and 2	Holt
Stephen	1450009			City Hall	Stephen
Strandquist	1450010	-	<u>Low</u>	City Hall	Strandquist
Thief Lake Wildlife Management Area	5450047	-	<u>High</u>	County Road 49	Thief Lake
United Lutheran Church	5450003	-	<u>Low</u>		Gatzke
Viking	1450011	<u>completed</u>	<u>Low</u>		Viking
Warren	1450012	-	<u>Low</u>	120 East Bridge Avenue	Warren

Source: Minnesota Department of Health, 2006

Appendix E: List of Acronyms 2012-2015

Ag BMP	Agricultural Best Management Practices
BMP	Best Management Practices
BWSR	Board of Water and Soil Resources
CD	County Ditch
CRP	Conservation Reserve Program
CCRP	Continuous Conservation Reserve Program
DNR	Department Natural Resources
DWSMA	Drinking Water Supply Management Area
EQIP	Environmental Quality Incentives Program
EPA	Environmental Protection Agency
FCA	Fish Consumption Advisory
FEMA	Federal Emergency Management Administration
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
GIS	Geographical Information System
GPS	Global Positioning System
HEL	Highly Erodible Lands
HSPF	Hydrological Simulation Program-Fortran
IBI	Index of Biotic Integrity
IWI	International Water Institute
JD	Judicial Ditch
LWMP	Local Water Management Plan
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MN	Minnesota
MPCA	Minnesota Pollution Control Agency
MSTRWD	Middle-Snake-Tamarac Rivers Watershed District
MWRPP	Major Watershed Restoration and Protection Project
NMW	Northern Minnesota Wetlands
NPS	Non Point Source
NRCS	Natural Resources Conservation Service
NTU	Nephelometric Turbidity Units
NW	Northwest
PWP	Permanent Wetland Reserve
RIM	Re-Invest Minnesota
RLWD	Red Lake Watershed District
RRV	Red River Valley
RRWMB	Red River Watershed Management Board
SD	State Ditch
SSTS	Subsurface Sewage Treatment Systems
SWAG	Surface Water Assessment Grant
SWAT	Surface Water Assessment Tool
SWCD	Soil and Water Conservation District
SWI	Side Water Inlets

TMDL	Total Maximum Daily Load
TRWD	Two Rivers Watershed District
USGS	United States Geological Survey
WCA	Wetland Conservation Act
WD	Watershed District
WMA	Wildlife Management Area
WRAC	Water Resources Advisory Committee
WRP	Wetland Resource Program

Appendix F: References Cited

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