



Minnesota  
Pollution  
Control  
Agency

Regional  
Environmental  
Management  
TMDL Program

MPCA Area Offices:

**Rochester area:**  
507/285-7343  
**Mankato area:**  
507/389-5977  
**Marshall area:**  
507/537-7146  
**Willmar area:**  
320/214-3786  
**Detroit Lakes area:**  
218/847-1519  
**Brainerd area:**  
218/828-2492  
**Duluth area:**  
218/723-4660  
**Metro area:**  
651/296-6300  
**Toll-Free Number:**  
800/657-3864

# South Branch Yellow Medicine Fecal Coliform TMDL Project

Water Quality/Basins #3.08, June 2004

The South Branch of the Yellow Medicine River, located in Lincoln and Lyon Counties in southwestern Minnesota, has been placed on Minnesota's 2004 list of impaired waters for fecal coliform bacteria. Fecal coliform bacteria entering the South Branch must be reduced by 82 percent in order to meet the water quality standards set to protect swimming and other recreational uses, according to a draft report by the Minnesota Pollution Control Agency.

The report describes the fecal coliform bacteria impairment and proposes strategies to achieve the water quality standard. Fecal coliform bacteria come from the intestines of warm-blooded animals. If fecal coliform bacteria are present, disease causing organisms may be in the water also.

## Clean Water Act TMDL program

The report is part of a nationwide effort under the federal Clean Water Act to identify and clean up pollution in streams, rivers and lakes. Every two years states are required to submit a list of impaired waters to the U.S. Environmental Protection Agency (EPA). States and local organizations must determine the total maximum daily load of pollutants that a water body can carry and still meet water quality standards. Citizen participation is an important component of the Total Maximum Daily Load (TMDL) process.

The South Branch of the Yellow Medicine River flows about 38 miles on a southwest to northeast course through a subwatershed of 79,731 acres. Nearly 99 percent of the area is in cropland. The population totals about 1,730, with the majority residing in the city of Minneota, population 1,550. Extensive ditching has improved agricultural

production, but it also has increased stormwater runoff, carrying nutrients and sediment into the river.

The focus of the South Branch Yellow Medicine River TMDL project is to understand the cause-effect relationships between land use practices and water quality in terms of fecal coliform bacteria. Sampling at 11 sites in 1999, and 25 sites in 2001 showed impairment by fecal coliform bacteria during at least one summer month. Six of the sites were used in both sampling years.

The water quality standard for fecal coliform bacteria is an average of 200 colony forming units (CFU) per 100 milliliters (mL) of water. Above this level there is greater risk of disease caused by bacteria. This causes the water to be less suitable for swimming or recreation. The average count in the South Branch during the summer was 970 organisms per 100 mL.

After determining the need for an 82 percent reduction in fecal coliform loading, the report calls for a focus on high priority subwatersheds for implementation activities, and continued intensive monitoring to measure the success of the plan and performance of specific implementation activities.

## Sources of fecal coliform bacteria

There were two primary sources of fecal coliform bacteria. The major source was associated with the land application of stored manure, dominant during wet periods. Non-compliant septic systems (direct discharges of sewage) also were



sources of bacteria, tending to be more significant during dry periods. Runoff from overgrazed pasture was a minor source of bacteria. Drain tiles with surface intakes are considered a significant fecal coliform delivery mechanism.

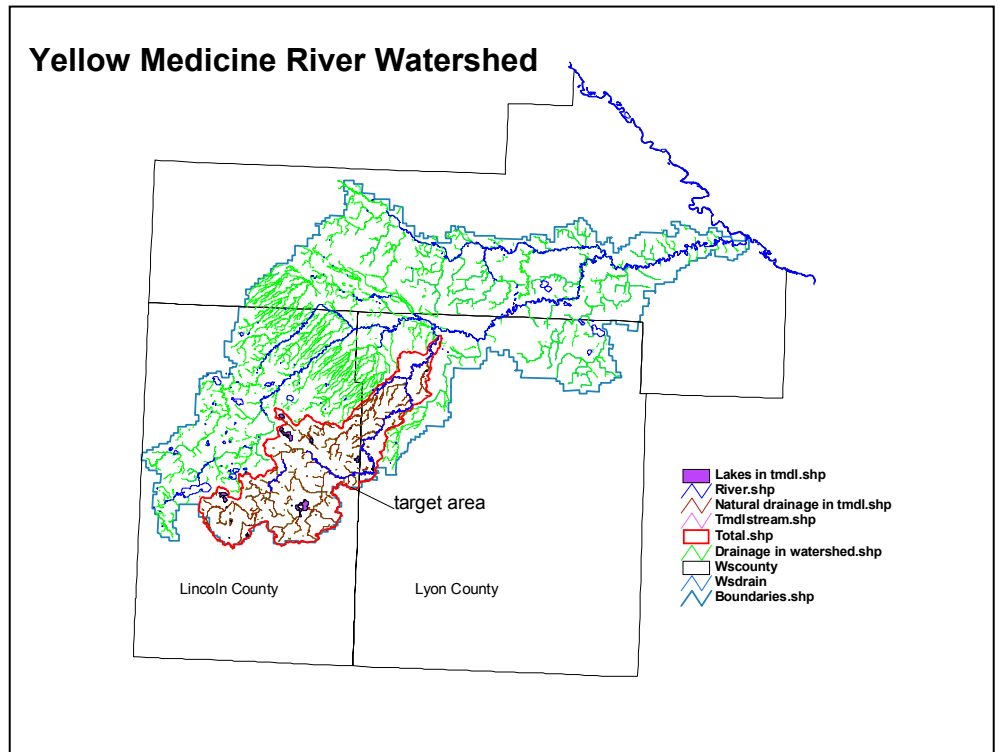
**82 percent reduction needed**

The Yellow Medicine River Watershed District has embraced a watershed-wide goal of achieving water quality standards for fecal coliform bacteria within 10 years, the same time frame as the TMDL. To achieve the water quality goal of 180 organisms/100ml, an 82 percent reduction in fecal coliform loading is required. The TMDL results suggest that it is crucial to get this level of reduction in the areas of animal production and manure handling, including the animal confinement, manure containment, and manure soil application aspects. The Minneota wastewater treatment plant is optimized and is a very small loading source.

A spread sheet matrix approach was used to evaluate the data. The matrix indicates that the TMDL water quality goal of 180 organisms/100ml is satisfied in the spring and fall, but fails to meet the standard during the summer season. The matrix shows that the vast majority of the bacterial loading to the stream is from manure application; urban, point, and wildlife bacterial loads are insignificant in comparison.

**Public involvement necessary**

Public participation has been the hallmark of the South Branch TMDL from the beginning. Two public meetings have been conducted following the diagnostic phase of the TMDL. A feedlot survey was conducted using the Lincoln and Lyon SWCD staff. To complete the survey, several landowners were approached on a one-to-one basis to obtain the feedlot data. Throughout the current Phase II



CWP implementation plan, landowners have been involved in planning and implementing nutrient control strategies.

An agricultural watershed will never be as pristine as its former pre-settled state. Realistic goals should reflect the constraints of the local economy and subsequent land use practices. The implementation controls must be contiguous with the local culture, in that a great degree of local “buy in” is necessary for the general success of the project. The project staff, partners, and technical committee feel the goals are realistic and obtainable, and that the initial success of the implementation plan is crucial to the long term management of the watershed water quality. Following EPA approval of the TMDL report, several meetings with the watershed “stakeholders” will be conducted presenting the draft implementation plan for public comment and input. The final implementation plan will be modified by the input and approval of the stakeholders.

**Implementation strategies**

Implementation strategies are directed at manure management since it is considered to be the vast majority

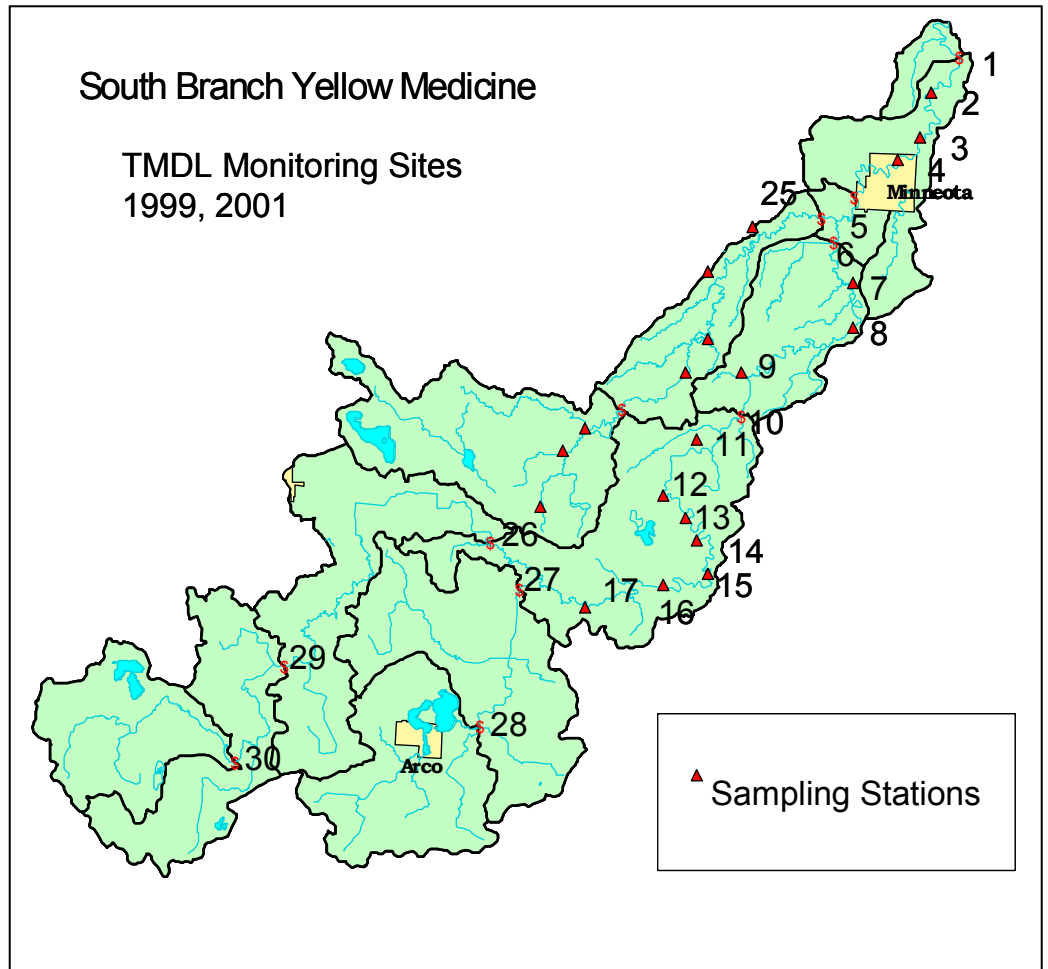


of the loading to the river. Strategies under consideration include terraces, grass waterways, sediment control watersheds, CREP/CRP, sewer systems, tillage practices, buffer strips, filter strips, replacement of open tile intakes with blind intakes, nutrient and pest management, the EQIP program, French intakes, crop residue, riverbank restoration, wetland restoration, and feedlot control methods. Manure is considered to be the vast majority of the loading to the river and will subsequently require the most attention. New feedlot rules require that manure management plans be developed for any feedlots that need a permit. Buffer strips, immediate incorporation, and maintenance of surface residue have been demonstrated to reduce manure and pathogen runoff. For feedlots of 300 animal units or less the rule consists mainly of maximizing participation in the new Open Lot Agreement.

Stream buffers are considered to be the best alternative for controlling the bacterial runoff to the streams. The diagnostic study has shown that rainfall events drive stream fecal coliform levels to exceedence levels at 24 of 25 monitoring sites. Other implementation tools are: rotational grazing, conservation tillage, and residential wastewater treatment. The leadership of the implementation will be sponsored by the Yellow Medicine River Watershed District Managers.

**For more information**

For more information on the Yellow Medicine River fecal coliform bacteria TMDL project, contact Muriel Runholt, MPCA-Marshall, 507-537-7137; or Terry Renken, Yellow Medicine River Watershed District, 507-872-6720.



General information on TMDLs can be found on the Web at the following sites:

**Minnesota Pollution Control Agency**  
[www.pca.state.mn.us/water/tmdl/](http://www.pca.state.mn.us/water/tmdl/)  
[www.pca.state.mn.us/water/basins/mnriver/index/](http://www.pca.state.mn.us/water/basins/mnriver/index/)

**U.S. Environmental Protection Agency**  
[www.epa.gov/owow/tmdl/](http://www.epa.gov/owow/tmdl/)

**TMDLs.net** - America's Clean Water Foundation and the Association of State and Interstate Water Pollution Control Administrators  
[www.tmdls.org/](http://www.tmdls.org/)