



Minnesota
Pollution
Control
Agency

Turbidity

Measures water clarity; related to particles in water (sediment and algae)

TMDL

The total amount of a pollutant that a water body can carry without violating water quality standards

MPCA Area Offices:

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Lower Vermillion River Watershed Turbidity TMDL

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The list of impaired waters developed by the Minnesota Pollution Control Agency (MPCA) includes the Vermillion River from Hastings, Minn. to its confluence with the Mississippi River. This section is known as the Lower Vermillion River (LVR). Water quality monitoring of the LVR has shown that its turbidity levels frequently exceed the State standard of 25 nephelometric turbidity units (NTU).

As required by the Clean Water Act, the MPCA is developing a total maximum daily load (TMDL) to address the turbidity impairment. A TMDL study calculates the maximum amount of a pollutant that a water body can receive (also known as a loading capacity) without violating water quality standards. The TMDL process identifies all sources of the pollutant causing the impairment and determines the source reductions necessary to meet water quality standards.

Description of Water Body

The Vermillion River Watershed is located southeast of the Twin Cities metropolitan area. The Vermillion River travels approximately 59 miles from its headwaters in southeastern Scott County near New Market to the confluence with the Mississippi River south of Lock and Dam Three. The watershed drains nearly 356 square miles and consists of 17 subwatersheds. At the falls in Hastings, the river drops 90 feet to join the floodplain of the Mississippi River. The shared floodplain is known as the Vermillion River Bottoms. On this alluvial floodplain, the LVR parallels the Mississippi River for approximately 20 miles before joining it just downstream from Lock and Dam Three near Red Wing. The flow of the

LVR is largely affected by flow in both the Mississippi and Cannon Rivers.

Water Quality Impairment

Turbidity is a measure of water clarity and is an indicator of water quality. It is caused by suspended and dissolved matter such as clay, silt, organic matter and algae. Increased turbidity levels limit light penetration and inhibit healthy plant growth. High turbidity can make it difficult for aquatic organisms to find food, affect gill functions and damage spawning habitat. Prolonged periods of high turbidity can have significant impacts on aquatic ecosystems, and can ultimately affect the quality of local plant and fish communities.

Pollution Sources

Both point and nonpoint sources of pollution contribute to LVR turbidity impairment. Point sources refer to pollutants routed through a specific and identifiable conveyance, like a pipe. Nonpoint sources refer to pollutants that travel to surface waters via overland runoff or from near-channel erosion. Turbidity levels can be elevated by erosion from fields and construction sites, urban runoff from precipitation, eroding streambanks, action of bottom-feeding organisms, such as carp, and excessive algal growth.

Project Partners and Process

The LVR Watershed Turbidity TMDL is being developed in collaboration with the MPCA, MN Department of Natural Resources, Army Corps of Engineers, Metropolitan Council, Dakota County, the Dakota County Soil and Water Conservation District, the Vermillion River Joint Powers Organization and Tetra Tech, the project's technical consultants.

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The goals of the LVR Watershed Turbidity TMDL Project are as follows:

- Describe the nature and extent of turbidity in the highly complicated setting of the LVR
- Determine turbidity source load allocations that consider major sediment and nutrient sources
- Produce a final report that expresses the complicated turbidity dynamics in terms of an “allocation” among sources and provides recommendations for corrective actions.

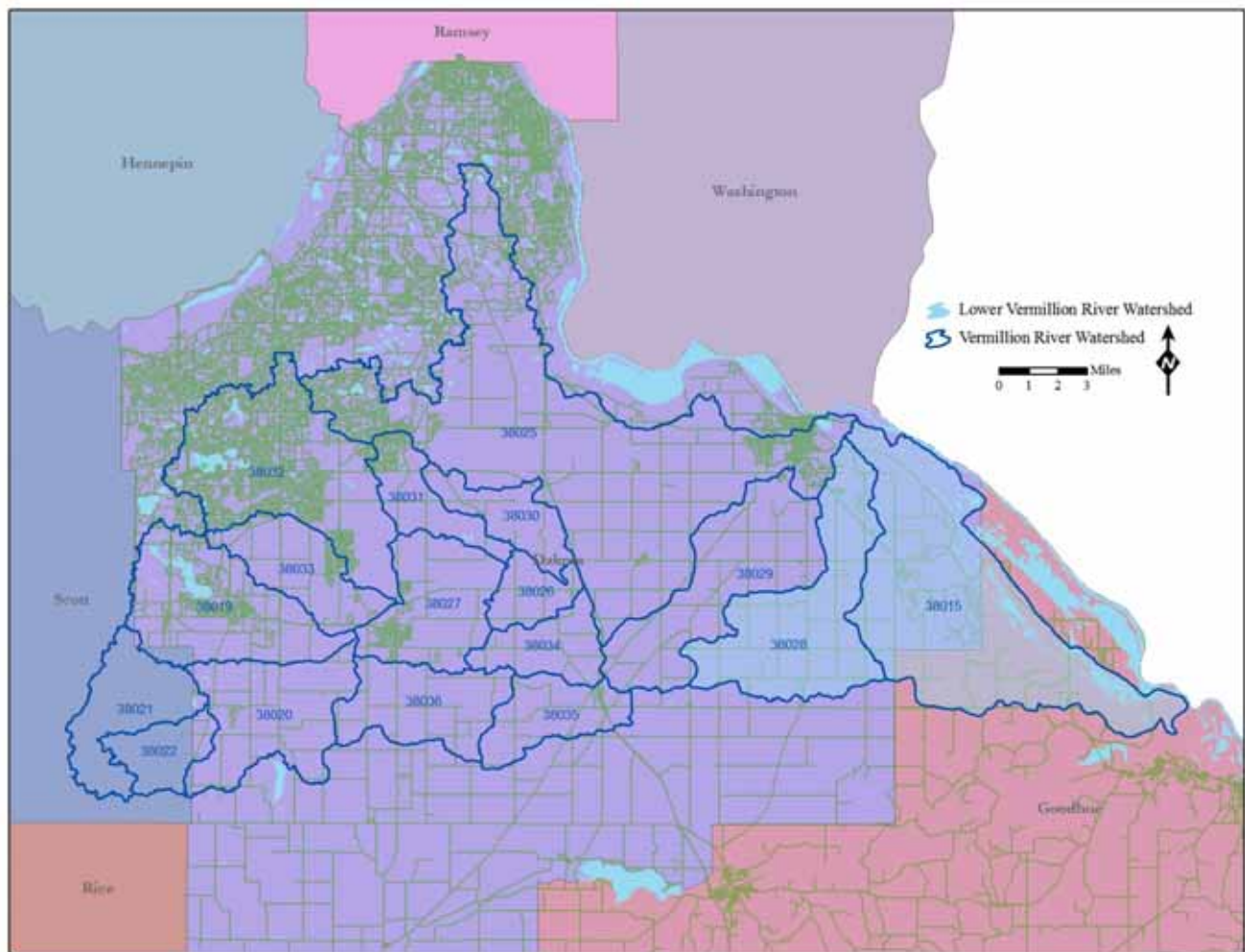
Due to the complexity of the system, the project has been segmented into three phases:

- Phase I: Data Gathering and Conceptual Model Development (2003-2004)
- Phase II: Sampling and Model Development (2006-2007)
- Phase III: Model Refinement and TMDL Development (2006-2007)

When the TMDL study is complete, an implementation plan will be developed. The implementation plan will identify voluntary and regulatory means of achieving the source reductions necessary to meet water quality standards. Citizen involvement, education and outreach and pollution prevention are key components of all TMDL implementation plans.

For More Information

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The two eastern most subwatersheds (38028 and 38015) of the larger Vermillion River Watershed make up the Lower Vermillion River Watershed.