Minnesota Pollution Control Agency

Getchell, Unnamed, and Stony Creeks Turbidity Total Maximum Daily Load Project

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This report includes a turbidity Total Maximum Daily Load (TMDL) for Getchell, Unnamed, and Stony Creeks, three stream tributaries in the Sauk River Watershed in Central Minnesota. The Sauk River Watershed lies in the heart of the North Central Hardwood Forest Ecoregion and discharges to the Upper Mississippi River. Land use in the watershed is primarily agriculture with the majority of land in corn/soybean rotations and pasture land. Unnamed Creek was included on Minnesota's 2008 303(d) TMDL list for excess turbidity. Neither Stony nor Getchell Creeks are currently on this list but were included in this document for turbidity assessment due to the significant proportion of loading into the Sauk River from these two watersheds.

Turbidity is a measure of the cloudiness or haziness of water caused by suspended and dissolved substances in the water column. Turbidity can be caused by increased suspended soil or sediment particles, phytoplankton growth, and dissolved substances in the water column. Since turbidity is a measure of light scatter and adsorption, loads need to be developed for a surrogate parameter. Total suspended solids (TSS) is a measurement of the amount of sediment and organic matter suspended in water and is often used for loading allocations and capacities.

Section 303(d) of the Clean Water Act requires that states develop TMDLs for surface waters that do not meet and maintain applicable water quality standards. A TMDL sets the amount of a given pollutant that the water body can withstand without creating an impairment of that surface water's designated use.

Once this maximum load is identified, the state must then identify the sources of the pollutant load both point sources (such as waste water treatment facilities), and non-point sources (such as pollution in runoff and seepage from land areas) and allocate to each of those sources how much they may contribute to the overall load and, if they are exceeding that allocation, what they need to do in order to help meet the water quality standard.

TMDL Progress in the Getchell, Unnamed, and Stony Creeks area

At this time, there is no paired turbidity and TSS sampling data available for Stony and Unnamed Creek. However, over 100 readings of paired turbidity-TSS data were collected in the North Fork Crow/Crow River watershed from Mill Creek to its outflow to the Mississippi River. The Sauk and North Fork Crow/Crow are adjacent watersheds located in the Upper Mississippi River Basin and North Central Hardwood Forest ecoregion with similar land-use and soil types. Thus, the turbidity surrogate developed for the North Fork Crow River Turbidity TMDL (79 mg/L) was adopted as the surrogate value for Stony and Unnamed Creek for the purpose of this TMDL study.

Minnesota Pollution Control Agency • 520 Lafayette Rd. N., St. Paul, MN 55155-4194 • www.pca.state.mn.us
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Upon approval, the 79 mg/L surrogate will be used as a benchmark concentration for discharges in these watersheds which permitted activities should not exceed. TMDLs were established for Getchell, Unnamed, and Stony Creeks using the load duration curve approach (Cleland 2002). It was estimated that a 35 percent to 95 percent reduction in TSS is required for Unnamed and Stony Creek during the higher flows and 7 percent to 66 percent reduction during the lower flows to meet current state standards. The only load reduction required for Getchell Creek is during the high flow category, where a 26 percent reduction is needed to comply with state standards.

The complete TMDL study report can be found on the MPCA Web site at: www.pca.state.mn.us/water/tmdl/project-getchelcreek-turbidity.html.

For more information

For more information about this study and how it relates to MPCA's Impaired Waters programs, contact the MPCA at 651-296-6300 or 800-657-3864 and ask for the Getchell, Unnamed, and Stony Creeks TMDL Project Manager or the Public Information Officer in our Brainerd office.