EXECUTIVE SUMMARY
CANNON RIVER WATERSHED
STATISTICAL WATER QUALITY TREND ANALYSIS

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<u>NOTE:</u> *The full Cannon River Watershed Statistical Water Quality Trend Analysis report can be found in Appendix C.*

Overview

This study summarizes statistical trend modeling results for selected water quality monitoring sites in the Cannon River Watershed. The initial goal of the project was to analyze long term water quality trends from two river monitoring stations in the watershed using two different statistical tests—QWTREND and Seasonal Kendall. The project team assembled data and determined that there was insufficient data to run the QWTREND model. Results summarized in this report are based on the Seasonal Kendall statistical test. This report also summarizes trend analyses performed by Minnesota Pollution Control Agency's Citizen Stream and Lake Monitoring Programs data.

This report summarizes three studies: Part A- Statistical trend analysis performed for the Cannon River at Welch and the Straight River at Faribault by Deepak Sanjel from Minnesota State University, Mankato Mathematics Department. Part B - Minnesota Pollution Control Agency's Citizen Stream Monitoring Program's Transparency tube trend analysis for streams and rivers. Part C - Minnesota Pollution Control Agency's Citizen Lake Monitoring Program's Secchi disk trend analysis for lakes in the Cannon River Watershed.

Findings

Part A – Both the MPCA and USGS data were analyzed for the Cannon River monitoring site at Welch. Orthophosphorus and Fecal coliform showed statistically significant decreasing trends throughout the time periods studied in the MPCA data. On the other hand, turbidity showed a statistically significant increasing trend from 1995 to 2008 in the MPCA data. The majority of parameters analyzed in the MPCA data showed no statistically significant trends. Most of the Cannon River USGS water quality parameters analyzed also showed no statistically significant trends over the time periods analyzed. The exception was Soluble Reactive Phosphorus (SRP) which indicated a statistically significant increasing trend from 1996-2008.

Like the Cannon River main stem, most of the water quality parameters analyzed for the Straight River site showed no statistically significant trends over the time periods studied. However, two parameters did show a statistically significant decreasing trend in pollutants over the decade or two. The model indicated a decrease in Orthophosphorus from 2000-2008. Fecal coliform bacteria rates also showed a significant decreasing trend from 1991-2008.

Part B - MPCA's CSMP Stream Transparency Tube Trend Analysis in the Cannon River Watershed show mixed trends with the majority indicating increasing transparency trends. Fifteen (15) streams

indicate increasing water transparency trends, 3 show decreasing water transparency trends, and 9 show no statistically significant trends.

Part C - MPCA's CLMP Lake Secchi Disk Trend Analysis in the Cannon River Watershed show mixed trends. Nine (9) lakes show lake clarity increasing, 8 lakes show lake clarity decreasing, and 9 show no trends.