Appendix G: West Chaska Creek Monitoring Reports

Watershed Outlet Monitoring Program

West Chaska Creek Station – CH 1.0 Site

Chaska, MN

Summary Report

February – October 2010

Prepared By: Carver County Environmental Services
Prepared For: Lower Minnesota River Watershed District
December 2010

CARVER COUNTY

Introduction

The West Chaska Creek CH 1.0 site, located in Chaska north of US Highway 212 along Creek Road, has been in operation since 1998. The West Chaska Creek Watershed drains approximately 9,900 acres of mostly agricultural and undeveloped land (Appendix A). This report summarizes the results of flow, precipitation, and water quality for January – October 2010. The data is preliminary and is subject to change until the Metropolitan Council submits the final report for this period.

Flow and Precipitation

Average flow in West Chaska Creek was 13.36 cubic feet per second (cfs) or 8.63 million gallons per day (mgd) (Table 1). This is higher than the average from 2009 (12.06 cfs). The 2010 sampling season was characterized by dry/ drought conditions in May and July in addition with much higher than average precipitation (and thus stream flow) in August and September. A graph describing flow and precipitation results is provided (Figure 1).

Table 1. Average flow and total precipitation at West Chaska Creek CH 1.0 Station February – October 2010.

Period	Average Flow (cfs/mgd)	Precipitation (inches)	*Average Monthly Precipitation, 1997-2010 (inches)
FEBRUARY	27.36 / 17.68	0.94	0.82
MARCH	22.13 / 14.30	1.18	1.74
APRIL	11.57 / 7.48	3.63	2.93
MAY	10.25 / 6.62	2.75	3.85
JUNE	8.31 / 5.37	4.61	4.26
JULY	9.96 / 6.44	2.37	3.36
AUGUST	12.57 / 8.12	6.55	4.96
SEPTEMBER	10.97 / 7.09	5.22	3.40
OCTOBER	5.77 / 3.73	2.01	2.36
TOTAL	13.36 / 8.63	30.01	28.72

*Ave. monthly precipitation data obtained from the National Weather Service station located near the CH 1.0 site

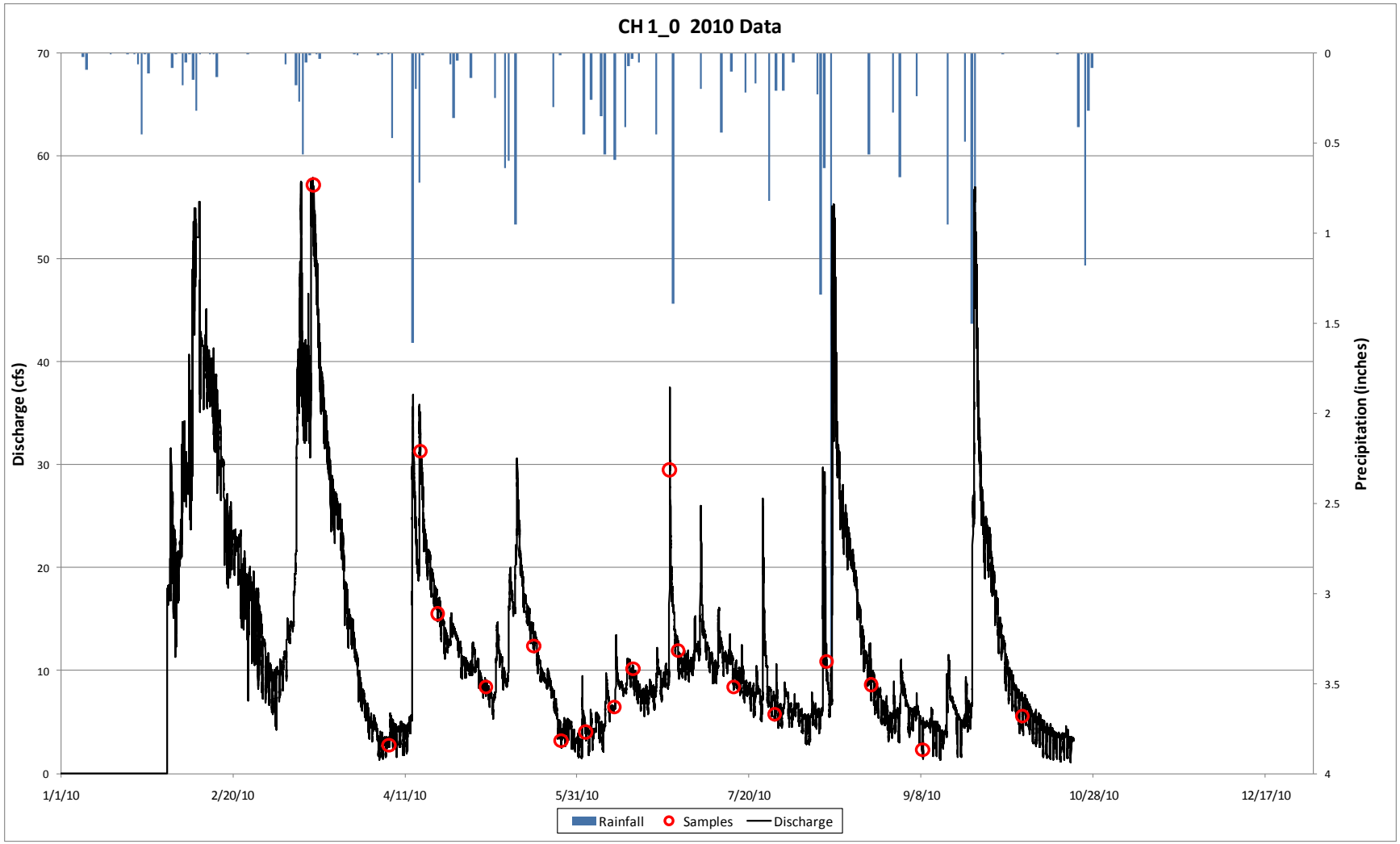


Figure 1. Flow and precipitation at CH 1.0 Station March-November 2009

Water Quality

Seven nutrient samples and twelve Escherichia Coli (E. coli) grab samples were collected at the CH 1.0 Station during the 2010 season. Overall, water quality parameters for West Chaska Creek declined from the previous year. There was some improvement in Escherichia coli, with a decline of 106 MPN/100 mL from the 2009 samples. The average total suspended solids (TSS) and turbidity increased by 640 percent and 510 percent, respectively, from 15 mg/L and 10 NTU in 2009 to 96 mg/L and 51 NTRU in 2010. While these averages may seem large, they are similar to the averages from 2008.

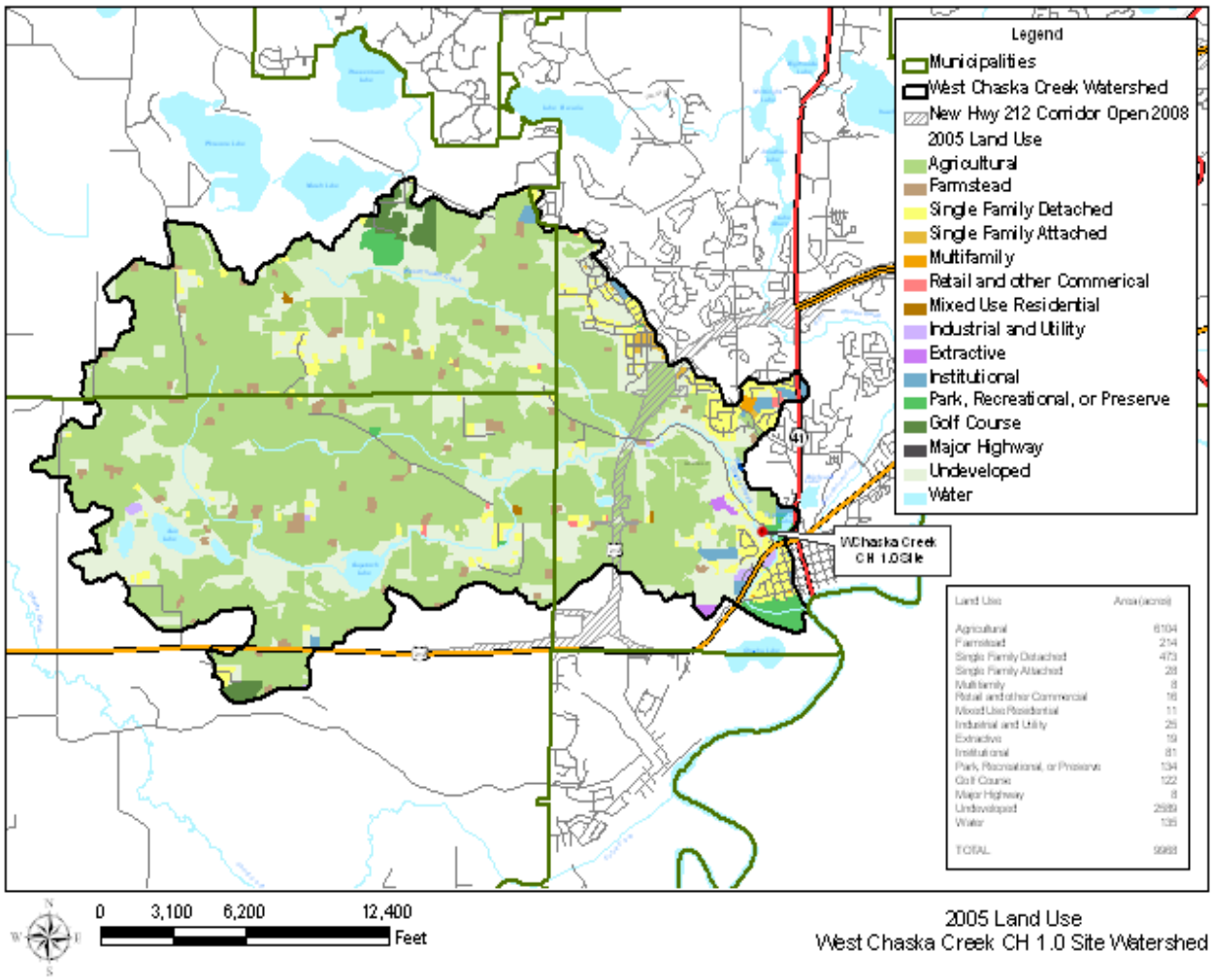
All parameters still exceeded that of typical streams in the North Central Hardwood Forest ecoregion (see Table 2). The 2010 average concentration of total phosphorus was roughly twice the ecoregion range while the concentration of Nitrate+Nitrite fell far outside the typical range. E.coli sampling showed an improvement to water quality from 2009 to 2010. Additional information about phosphorus and E. coli loading, statistical analyses, and biomonitoring data can be found in Appendix B. Appendix B contains the draft pages of the 2010 Carver County Water quality report that can be accessed through the Carver County website (http://www.co.carver.mn.us/departments/LWS/wqmp.asp) as a report that can be downloaded or through an interactive GIS water quality mapping program.

Table 2. Average concentrations at West Chaska Creek CH 1.0 Station February – October 2010.

Parameter	2010 Ave. Concentration	Notes
Alkalinity	230 mg/L $CaCO_3$	
Chemical Oxygen Demand	48 mg/L	
Cadmium	N/A	Not tested at this site
Chloride	N/A	Not tested at this site
Chlorophyll-a	N/A	Not tested at this site
Chromium	N/A	Not tested at this site
Conductivity	N/A	Not tested at this site
Copper	N/A	Not tested at this site
Escherichia coli	384.5 MPN/ 100 mL	Standard is 126/ 1260*
Hardness	N/A	Not tested at this site
Lead	N/A	Not tested at this site
Nickel	N/A	Not tested at this site
Nitrogen Ammonia	110 µg/L	
Nitrate + Nitrite	1652.86 µg/L	Ecoregion mean (40-260 ug/L)
Phosphorus, Total	0.360 mg/L	Ecoregion mean (0.060-0.160 mg/L)
Suspended Solids	96 mg/L	Ecoregion mean (4.8 - 16 mg/L)
Turbidity	51 NTRU	Ecoregion mean (3-8.5 NTU)
Solids, Volatile	12 mg/L	
Zinc	N/A	Not tested at this site

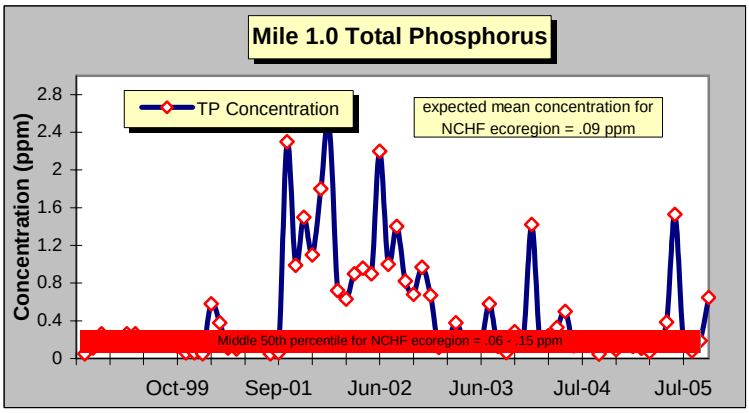
*As stated in MN Rules Chapter 7050.0222, E. coli shall not exceed 126 organisms per 100 mL as a geometric mean of not less than five samples, nor shall more than ten percent of all samples taken during any calendar month individually exceed 1,260 organisms per 100 mL.

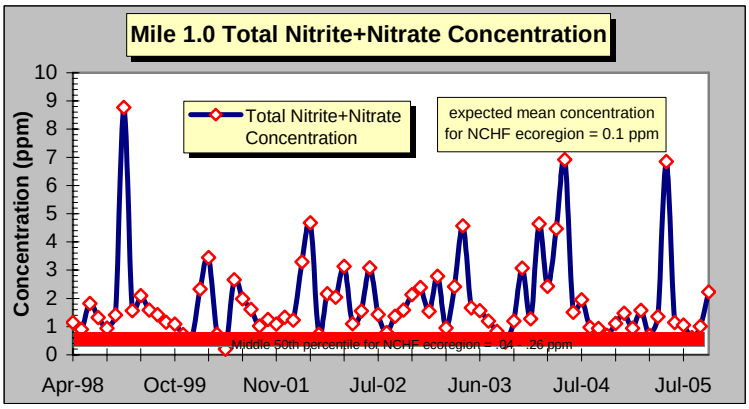
Appendix A

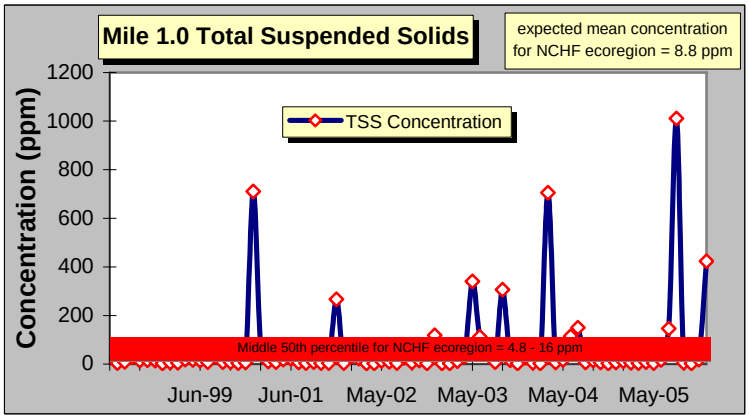


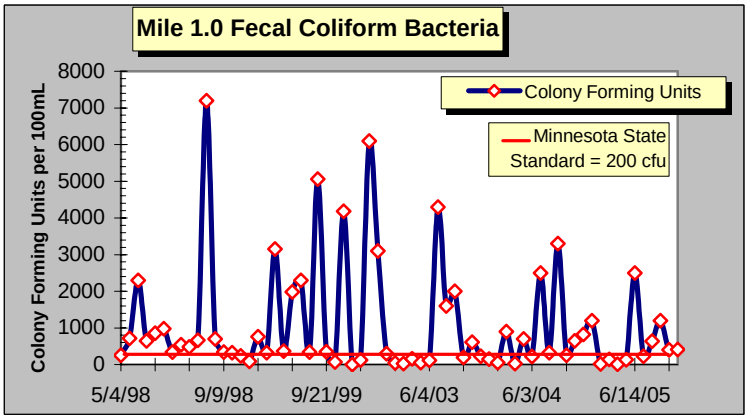
2005 Land Use data source provided by Metropolitan Council Environmental Services.

West Chaska Creek Mile 1.0 near CSAH 10 (CH 1_0) *Site 2*









This site is located near the intersection of U.S. Highway 212 and Chaska Creek, and was initially established as a joint venture between the Minnesota Department of Agriculture, Carver County Environmental Services, and the City of Chaska at the beginning of the 1998 sampling season.

The primary purpose for this site, because of its location near the mouth of the creek, is to gauge the output from the entire Chaska Creek watershed into the Minnesota River.

Water Quality Summary:

- Total phosphorous concentrations were above ecoregion averages, but have come down from previous years.
- Total nitrogen concentration continues to be a major problem at this site with concentrations well above the 75th percentile for streams in the NCHF ecoregion.
- Approximately half the total suspended solid concentrations were within or below the middle 50th percentile for the ecoregion.
- Although significant variability exists in the entire data set, Fecal Coliform Bacteria levels at the site continue to be near or above the standard of 200 cfu/100mL.