Watershed Outlet Monitoring Program

Eagle Creek Station

Savage, MN

Quarterly Report

Preliminary Data

October - December 2007

Prepared By:

Jaime Rockney

Water Quality Technician

Scott Soil and Water Conservation District

Prepared For:

Lower Minnesota River Watershed District

January 2008

Introduction

The Eagle Creek WOMP site is located in Savage near Hwy 13 and Hwy 101. This report summarizes the results of flow, precipitation, and water quality for the 4th quarter of 2007. This data is preliminary and is subject to change until the Metropolitan Council submits the final report for this period.

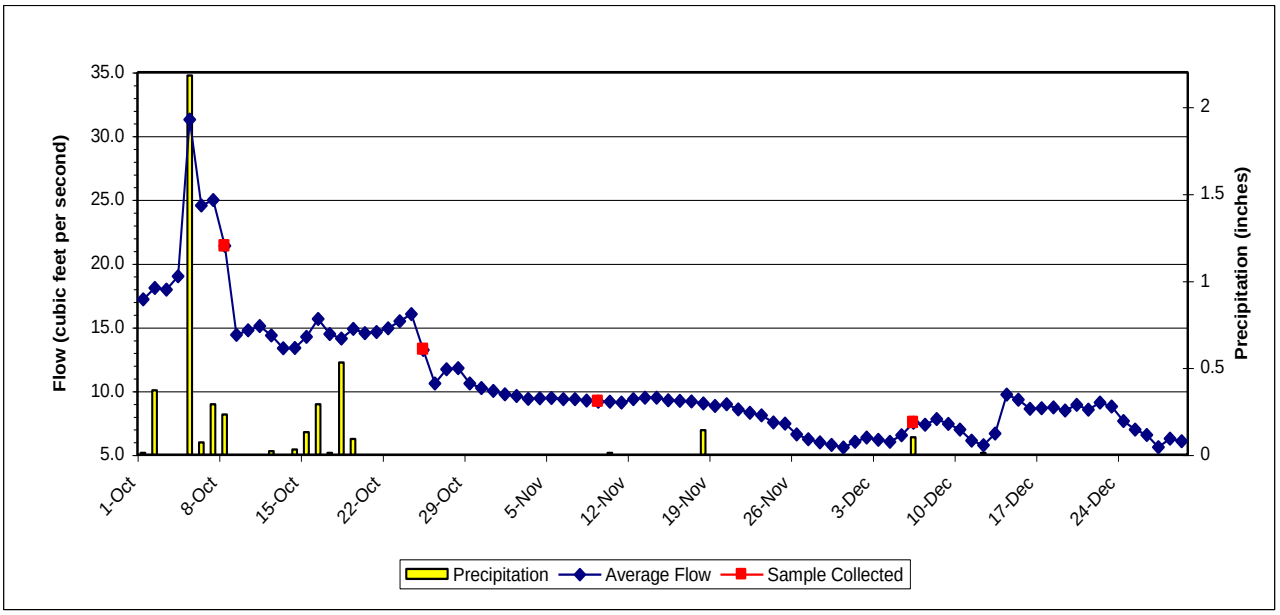
Flow and Precipitation

Table 1. Average flow and total precipitation at Eagle Creek WOMP station.

Period	Average Flow (cfs)	*Precipitation (inches)	30 year precipitation average from state climatology office
October	15.69	4.75	1.92
November	8.58	.17	1.17
December	7.30	1.43	.77
TOTAL	10.57	6.35	3.86

*Precipitation data was obtained from volunteer rain gauge monitor

Figure 1. Flow, precipitation, and sample collection at Eagle Creek WOMP Station.



4th Quarter Notes:

The bubbler was not tracking stage (depth of water) very well. This year it has been drifting so much that nearly every time we visited the station, we had to calibrate the bubbler to match the actual stage. Metropolitan Council replaced the bubbler with a new one on December 13. After a few more visits to the station, we will be able to see how well it has been tracking.

Metropolitan Council is also considering installing an in-situ flow meter in Eagle Creek to reduce the impacts beaver dams are having on the stage/flow relationship (rating curve) that has been developed. The new device would measure flow and stage to give instantaneous flow measurements, rather than relying on the rating curve that has been skewed by the dams. The way it is now, the bubbler measures stage and then computes what the flow would be based on equations we have in the program. The equations are based on numerous flow measurements that have been collected over many years of monitoring. The new flow meter would be measuring actual flow every 15 minutes.

Water Quality – One event grab and three base grab samples were collected at the Eagle Creek WOMP Station during the 4th quarter in 2007. Overall, water quality was excellent with all parameters in compliance with state standards or near the ecoregion mean (Table 2). No metals were sampled this quarter.

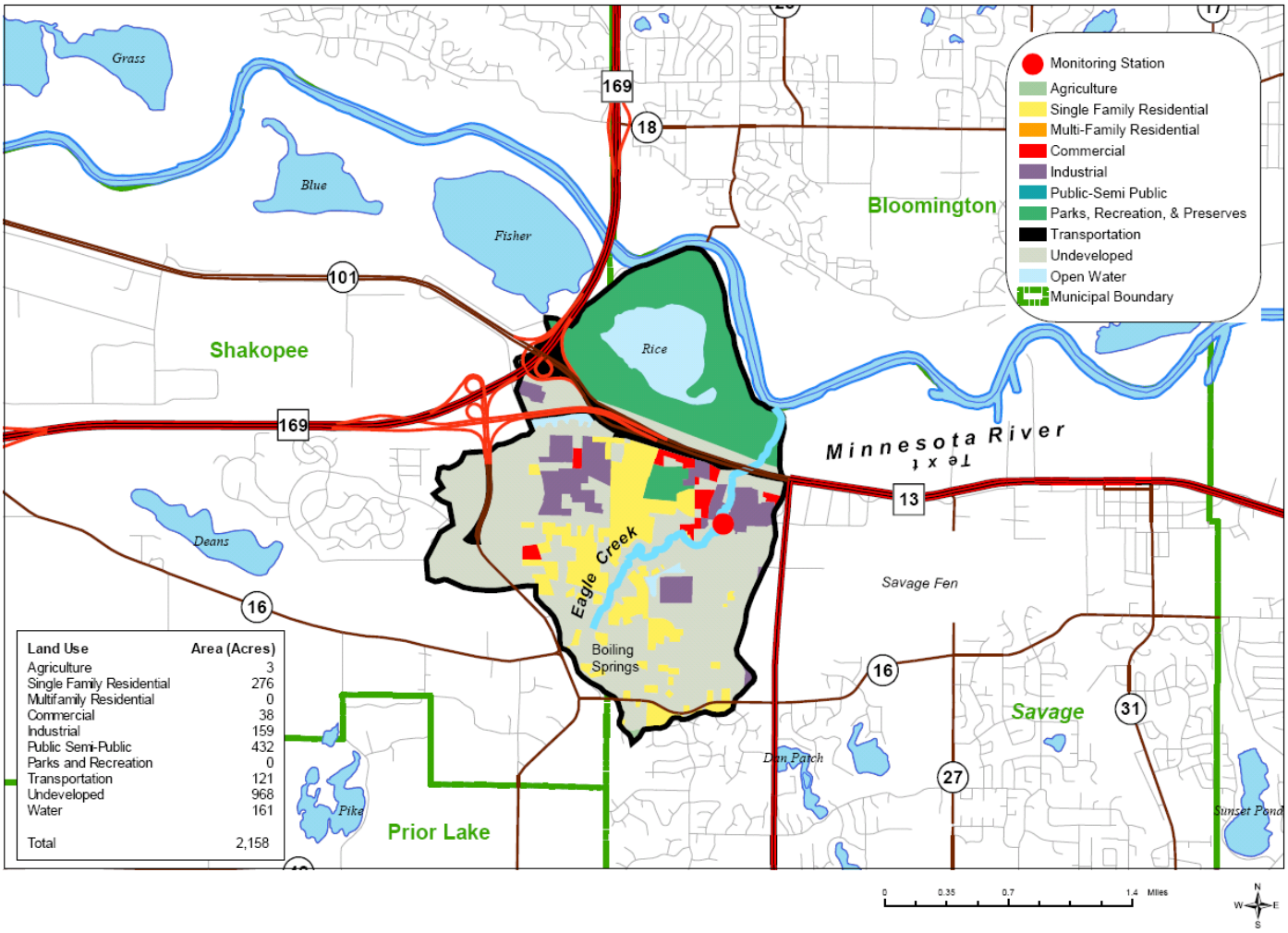
Table 2. Average concentrations at Eagle Creek WOMP Station

Parameter	1st quarter Avg Conc.	2nd Quarter Avg Conc.	3rd Quarter Avg. Conc.	4th Quarter Avg. Conc.	Unit	Notes – 2nd Quarter Results
Alkalinity	253	259	244	259	mg/L	No state standard. 20 – 200 mg/L typical. Less than 10 mg/L indicate poor buffer.
Biological Oxygen Demand (BOD5)	1.05	1.0	1.0	1	mg/L	Ecoregion mean = 2.7 mg/L.
Cadmium	.04	.04	.05		ug/L	State standard = 2.0 ug/L.
Chloride	23.2	25.5	27	27	mg/L	State standard = 230 mg/L.
Chlorophyll-a	83.5	67.3	64	62	ug/L	
Chromium	.4	.2	.5		ug/L	State standard = 365 ug/L.
COD	13.8	8.7	13.1	8.3	mg/L	
Conductivity	569	588	581	603	mMHOs	
Copper	.5	.5	.7		ug/L	State standard = 15 ug/L.
Dissolved Oxygen	8.89	8.3	7.67	8.18	mg/L	State standared = 7 mg/L.
Fecal Coliform Bacteria	102	43.7	151.5	71.3	CFU/100 mL	State standard = 200 CFU/100 ml water as geomean of at least 5 samples per month Apr – Oct.
Hardness	286	291	285	278	mg/L	No state standard. Water above 180 mg/L considered very hard water.
Lead	.3	.1	.1		ug/L	State standard = 7.7 ug/L.
Nickel	3	2.7	2.8		ug/L	State standard = 283 ug/L.
Nitrogen Ammonia	.05	.05	.043	.03	mg/L	State standard = .016 mg/L.
Nitrate + Nitrite	.32	.12	.15	.16	mg/L	Ecoregion mean = .16 mg/L.
pH	7.75	7.61		7.73	su	State standard = not less than 6.5 nor greater than 8.5.
Phosphorus, Total	.08	.04	.06	.04	mg/L	Ecoregion mean = 0.13 mg/L. EPA recommends less than 0.1 mg/L. These results are the unfiltered average of result.
Suspended Solids	11	4	9.9	9	mg/L	Ecoregion mean = 13.7.
Total Kjeldahl Nitrogen	.34	.32	.30	.33	mg/L	
Total Organic Carbon	2.84	2.8	3.23	2.8	mg/L	
Turbidity	10.11	4.02	5.2	7.7	NTU	State standard = 10 NTU
Volatile Suspended Solids	3.4	1.6	3.1		mg/L	
Zinc	.9	3.0	3.4		ug/L	State standard = 191 ug/L

mg/L = milligrams per liter
ug/L = micrograms per liter
mMHO = micromhos or micorseimens
CFU = colony forming units
NTU = nephelometric turbidity units
Highlighted areas indicate areas of concern.
su = standard units
State standard = state standard for Class 2A waters with a hardness greater than 200

Appendix A - Watershed and land use information provided by Metropolitan Council Environmental Services.

Figure 1.EA. Eagle Creek Monitoring Station Location and Watershed Characteristics



Land Use	Area (Acres)
Agriculture	3
Single Family Residential	276
Multifamily Residential	0
Commercial	38
Industrial	159
Public Semi-Public	432
Parks and Recreation	0
Transportation	121
Undeveloped	968
Water	161
Total	2,158

Figure 3 and 4 below taken from the MN DNR, Division of Fish and Wildlife, Section of Fisheries "Stream Survey Report, Eagle Creek 2005."

Figure 3. Eagle Creek, Scott County, Minnesota - Historic Watershed (Land Cover data source: MLCCS 1999-2003).

Land Cover	Sum Acres	% Total
Unclassified	28.3497	1.31
Artificial Surfaces	852.1656	39.50
Planted or Cultivated Veg	204.9884	9.50
Forests	352.8935	16.36
Woodland	60.5463	2.81
Shrubland	3.9502	0.18
Herbaceous	543.9638	25.21
Water	110.7137	5.13

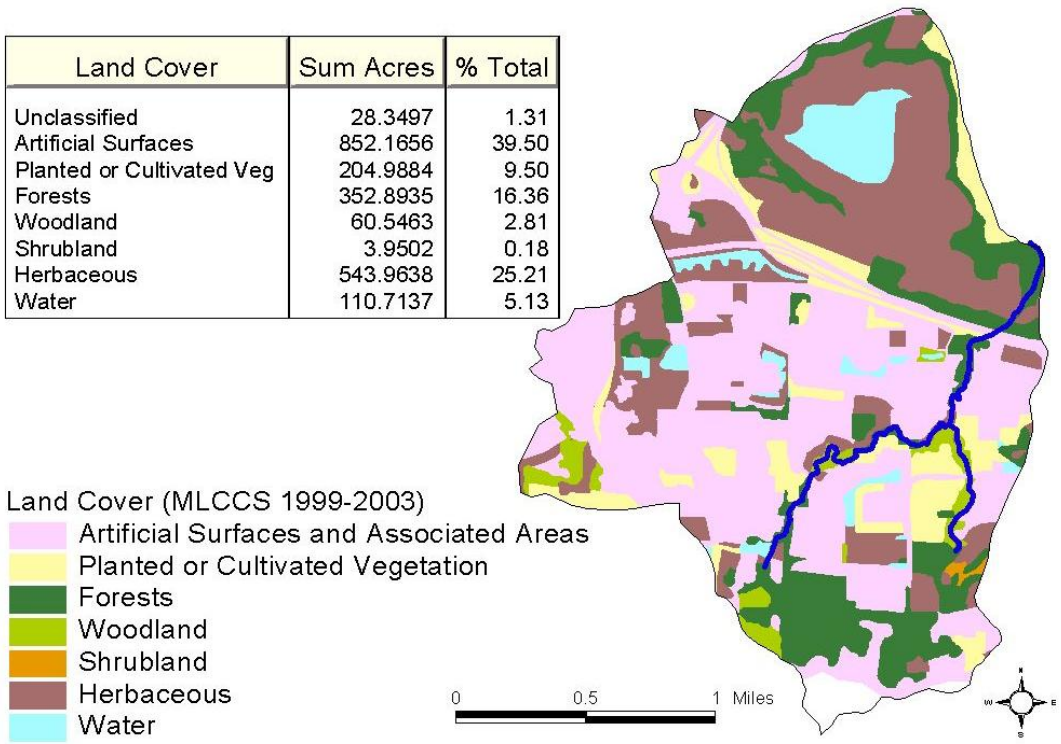


Figure 4. Estimated land cover, Eagle Creek functional watershed (Land Cover data source: MLCCS 1999-2003).

Land Cover	Sum Acres	% Total
Artificial Surfaces	54.8893	7.25
Planted or Cultivated Veg	67.9305	8.97
Forests	189.2233	25.00
Woodland	25.4945	3.37
Shrubland	3.9502	0.52
Herbaceous	348.3519	46.02
Water	67.1899	8.88