

Table 1.FC. Fish Creek Monitoring Station Information



Station Address: Fish Creek near Point Douglas Road, St. Paul, MN
County: Ramsey
Major Basin: Mississippi River Basin
Watershed: Carver Lake
Drainage Area: 5.09 square miles

Station Operator: Ramsey-Washington-Metro Watershed District

Metropolitan Council Environmental Services Contact Information:

Contact Person: Casandra Champion
Address: 2400 Childs Road
St. Paul, MN 55106
Phone: 651-602-8745
E-mail: casandra.champion@metc.state.mn.us

Watershed District or Watershed Management Organization:

Ramsey-Washington-Metro Watershed District

Station Overview: MCES has supported water quality monitoring of Fish Creek since 1995. The monitoring station is located in St. Paul, Minnesota, 0.2 mile upstream from the creek confluence with the Mississippi River. There is no rain gauge at this station; however, precipitation data are obtained from the Minnesota Climatology Working Group, St. Paul Airport Station Number 217386.

2002 Monitoring Year: Monitoring equipment was installed on April 11, 2002 and removed on November 8, 2002. Daily average flows were estimated prior to April 10 and after October 11. Snowmelt began during the last week of March 2002. The peak daily average flow of 22 cfs occurred on June 22, 2002.

Runoff event-based composite sampling began in early May 2002 and continued through early September. A significant runoff event occurred during the June 18-July 5, 2002 period. A composite sample collected during this event (June 21-22) had the highest total suspended solids (TSS) concentration (257 mg/L) of all 2002 samples.

Eighteen samples were collected for water quality analysis during 2001, including 11 composite samples and 7 grab samples. The MCES annual water quality monitoring plan includes 12 monthly baseflow (“non-event”) grab samples and approximately 10 to 15 flow-weighted composite samples collected during all runoff events in the open-water season (March-November). The 2002 sampling scheme did not meet the goals of the MCES monitoring work plan. January and February baseflow conditions were not characterized with grab samples, and the 2002 snowmelt period was not sampled. Necessary adjustments to the sampling scheme will be made prior to the 2003 monitoring year.

For additional stream monitoring information and monitoring methods regarding this site, see www.metrocouncil.org/environment/RiversLakes.

Figure 1.FC. Fish Creek Monitoring Station Location and Watershed Characteristics

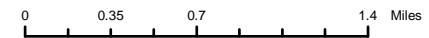
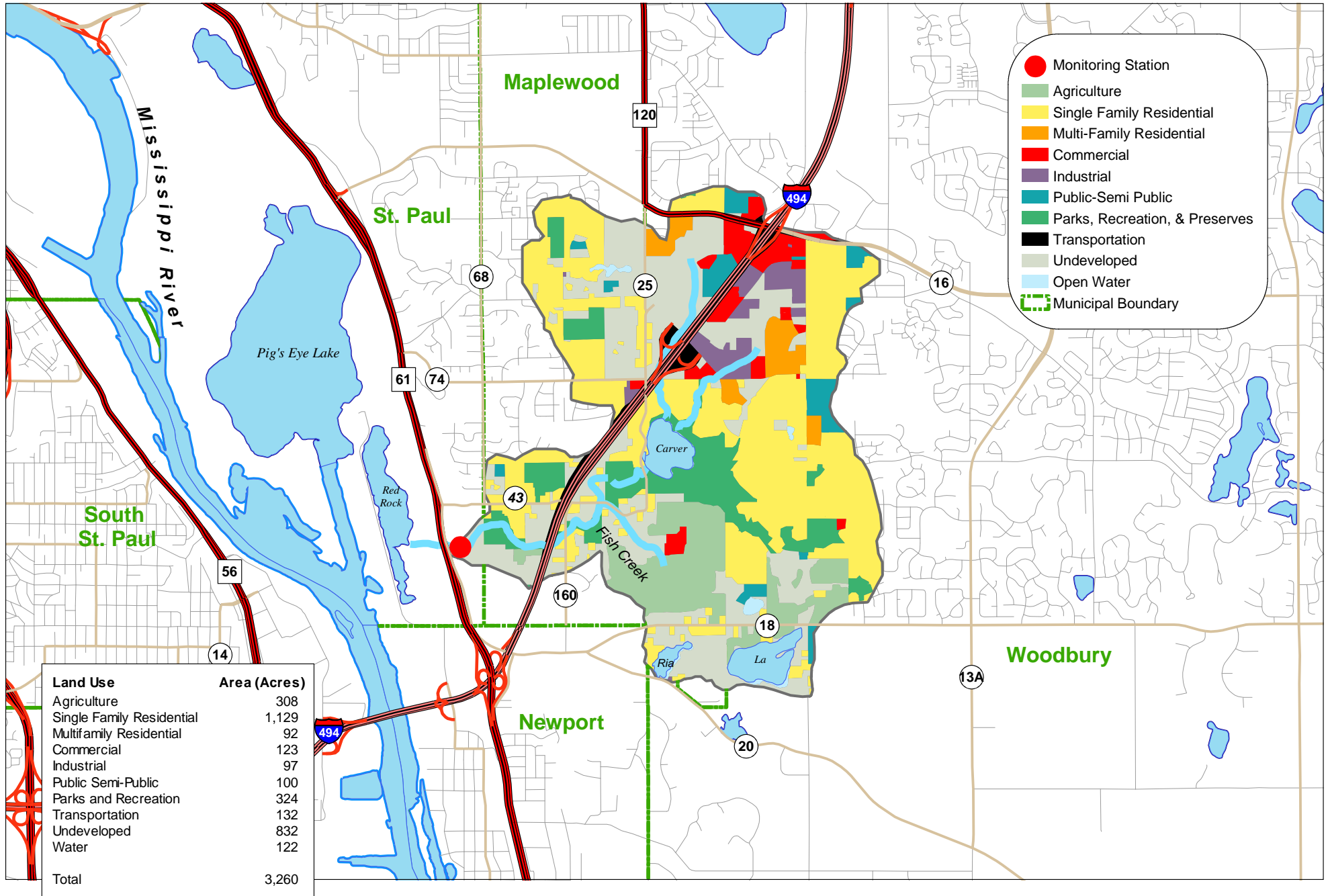


Figure 2.FC. Fish Creek 2002 Hydrograph, Precipitation and Sampling Information

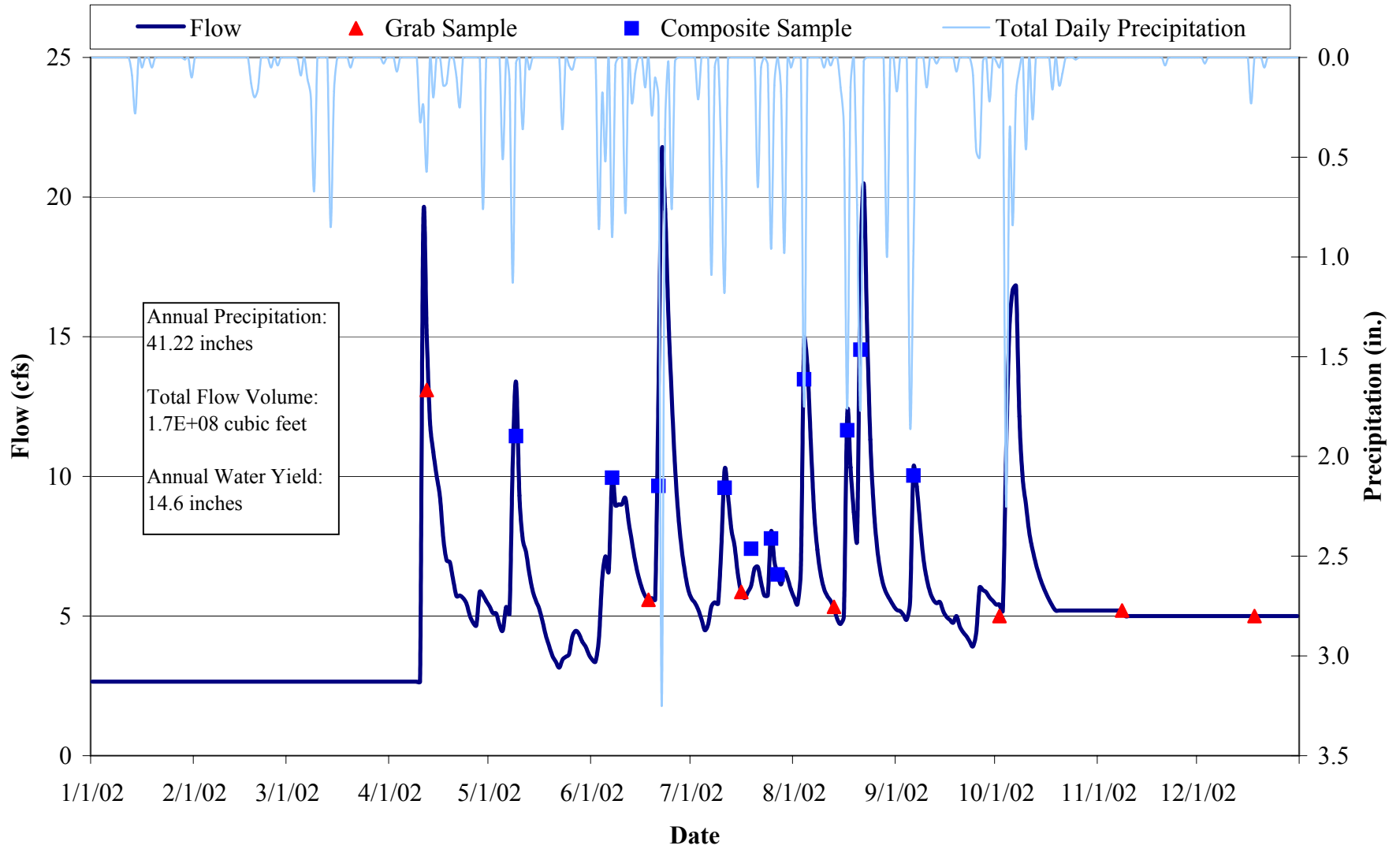


Table 2.FC. Fish Creek 2002 Water Chemistry Information

Variable	N	Mean	Median	Minimum	Maximum	25%	75%	STD
Chloride, mg/L	17	82	79	33	170	51	119	38
Hardness, mg/L	18	165	160	132	250	134	184	31
Cadmium, ug/L	16	0.1	0.1	<0.1	0.4	<0.1	0.2	0.1
Chromium, ug/L	16	1.9	1.6	0.2	7.3	0.4	3.0	1.9
Copper, ug/L	16	4.7	3.7	1.8	12.7	2.3	6.5	2.9
Lead, ug/L	16	3.0	1.4	0.1	14.5	0.2	4.9	3.9
Nickel, ug/L	16	3.2	2.7	1.6	8.1	2.1	4.0	1.6
Zinc, ug/L	16	10.3	6.6	2.4	35.0	3.2	15.3	8.9
Total Kjeldahl Nitrogen, mg/L	18	1.05	1.00	0.40	2.00	0.64	1.43	0.46
Total Nitrate Nitrogen, mg/L	17	1.43	1.07	0.16	3.50	0.47	2.35	1.11
Total Phosphorus, mg/L	18	0.26	0.20	0.04	0.75	0.09	0.42	0.20
Total Dissolved Phosphorus, mg/L	18	0.14	0.15	0.01	0.40	0.03	0.22	0.12
Total Suspended Solids, mg/L	18	59	36	2	257	4	102	68
Volatile Suspended Solids, mg/L	18	9	7	1	38	2	14	9
Turbidity, NTU	18	18	15	1	85	2	27	21

N: Sample Count

25%, 75%: 25th and 75th Percentiles

STD: Standard Deviation

Table 3.FC. Fish Creek 2002 Annual Loading Information* for Suspended Solids and Nutrients

Variable	Annual Load (tons)	Annual Yield (lbs/acre)	Annual Normalized Yield (lbs/acre/in of water)	Flow Weighted Mean Concentration (mg/L)
Total Suspended Solids	109	67	5	20
Total Phosphorus	0.94	0.58	0.04	0.17
Total Dissolved Phosphorus	0.52	0.32	0.02	0.10
Total Nitrate Nitrogen	5.17	3.17	0.22	0.96

* 2002 Annual Loading Information is provisional and may be subject to minor revisions.

Figure 3.FC. Fish Creek 2002 Hydrograph with Total Suspended Solids and Nitrate Nitrogen Concentrations

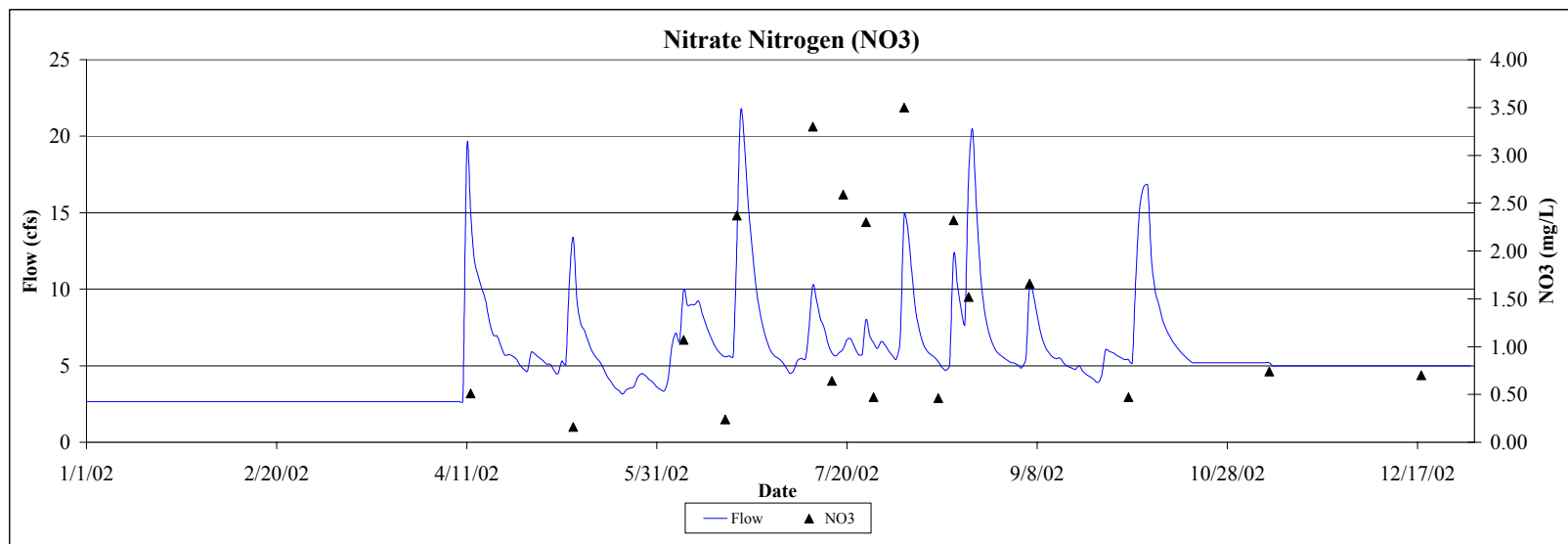
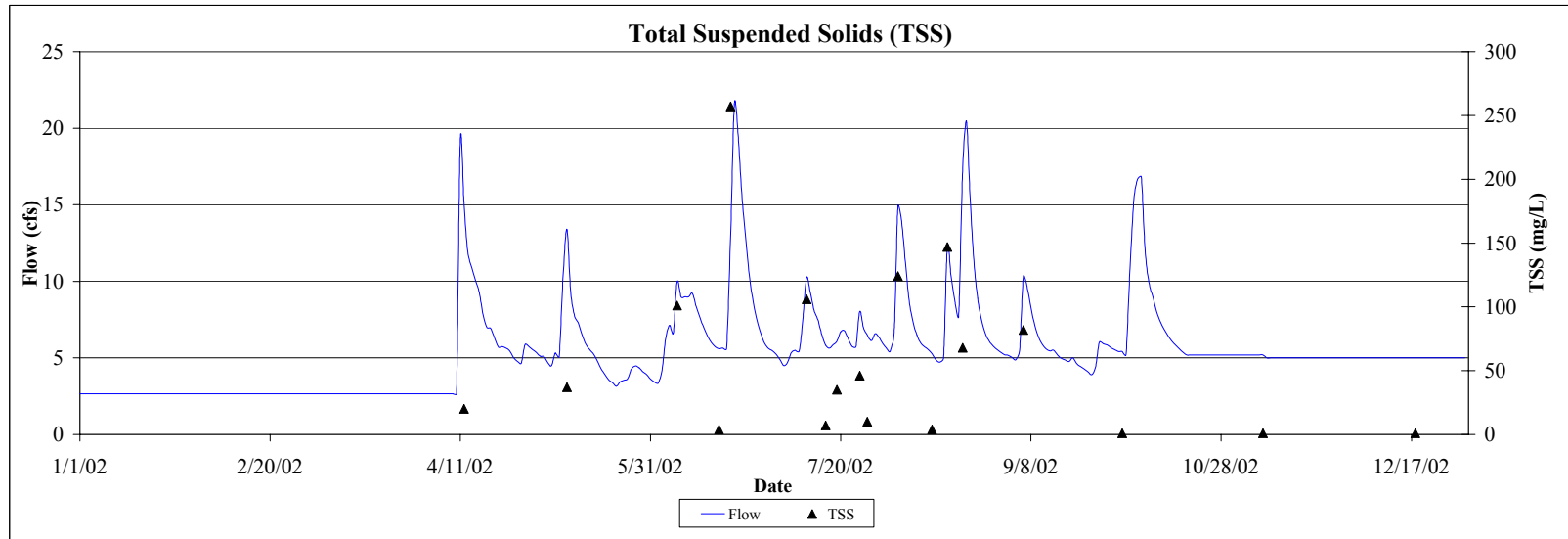


Figure 4.FC. Fish Creek 2002 Hydrograph with Total and Dissolved Phosphorus Concentrations

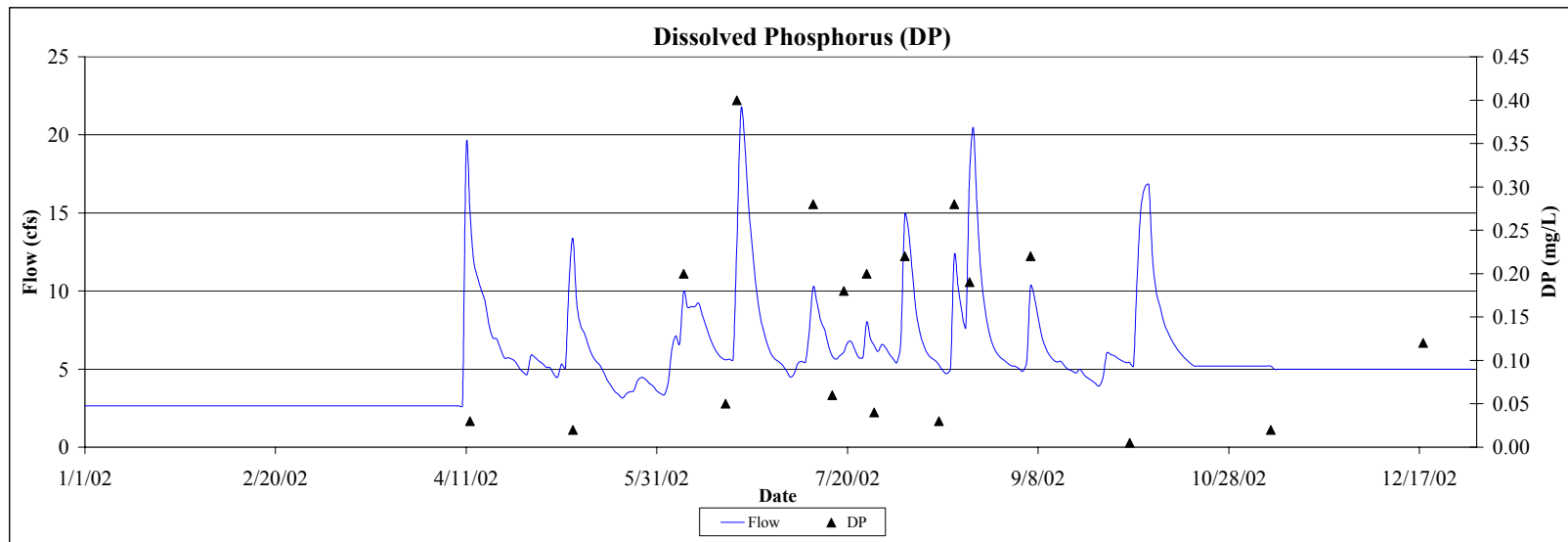
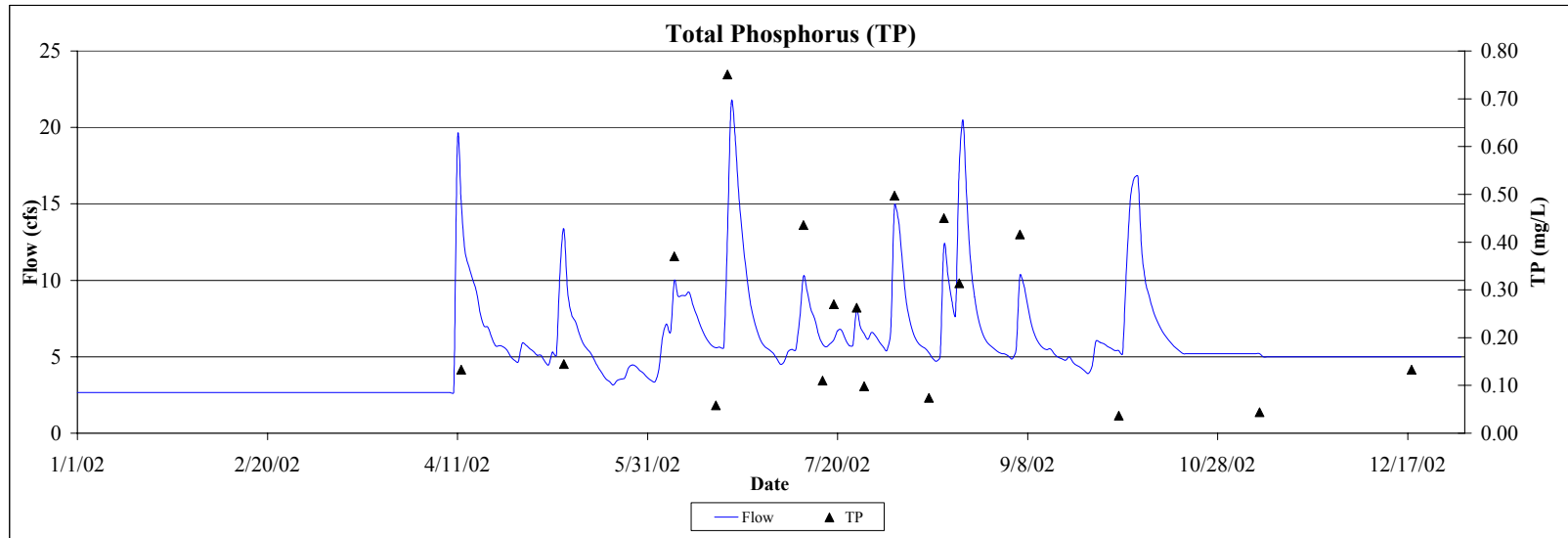


Table 4.FC. Fish Creek: Comparison of 2001-2002 Hydrology and Water Chemistry

	2001	2002
Hydrology		
Total Precipitation (in)	31.55	41.22
Water Yield (in)	10.1	14.6
Total Volume (cf)	1.2E+08	1.7E+08
Annual Load (tons)		
Solids, Total Suspended	65	109
Phosphorus, Total	0.53	0.94
Phosphorus, Total Dissolved	0.30	0.52
Nitrogen, Total Nitrate	3.09	5.17
Annual Yield (lbs/acre)		
Solids, Total Suspended	40	67
Phosphorus, Total	0.33	0.58
Phosphorus, Total Dissolved	0.18	0.32
Nitrogen, Total Nitrate	1.90	3.17
Annual Normalized Yield (lbs/acre/in of water)		
Solids, Total Suspended	4	5
Phosphorus, Total	0.03	0.04
Phosphorus, Total Dissolved	0.02	0.02
Nitrogen, Total Nitrate	0.19	0.22
Flow-Weighted Mean Concentration (mg/L)		
Solids, Total Suspended	17	20
Phosphorus, Total	0.14	0.17
Phosphorus, Total Dissolved	0.08	0.10
Nitrogen, Total Nitrate	0.83	0.96

Table 5.FC. Fish Creek 2002 Macroinvertebrate Monitoring Results and Metrics

Monitoring Date 6/7/2002

Class	Order	Family	Common Name	Life Stage	Organism Count
Crustacea	Amphipoda		Scuds	Adult	1
Crustacea	Isopoda		Sowbugs	Adult	1
Hirudinea			Leeches	Adult	2
Insecta	Coleoptera	Curculionidae	Water Weevils	Adult	1
Insecta	Coleoptera	Dytiscidae	Predaceous Diving Beetles	Larvae	4
Insecta	Coleoptera	Elmidae	Riffle Beetles	Larvae	9
Insecta	Diptera	Chironomidae	Midges	Larvae	301
Insecta	Diptera	Simuliidae	Black Flies	Larvae	6
Insecta	Diptera	Tipulidae	Crane Flies	Larvae	1
Insecta	Diptera		True Flies	Pupa	9
Insecta	Ephemeroptera	Baetidae	Small Minnow Mayflies	Larvae	231
Insecta	Trichoptera	Hydropsychidae	Common Netspinners	Larvae	1

Macroinvertebrate Taxa Metrics

Total Taxa	11
EPT Taxa	2
% EPT Taxa	18
Diptera Taxa	3
% Diptera Taxa	27
Mean Tolerance Value	5.6

Macroinvertebrate Organism Metrics

Total Organisms	567
EPT Individuals	232
% EPT Individuals	41
Diptera Individuals	308
% Diptera Individuals	54
Chironomidae Individuals	301
% Chironomidae Individuals	53

Water Quality

Degree of Organic Pollution

Family-Level Biotic Index	5.1	Fair	Fairly substantial pollution likely
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