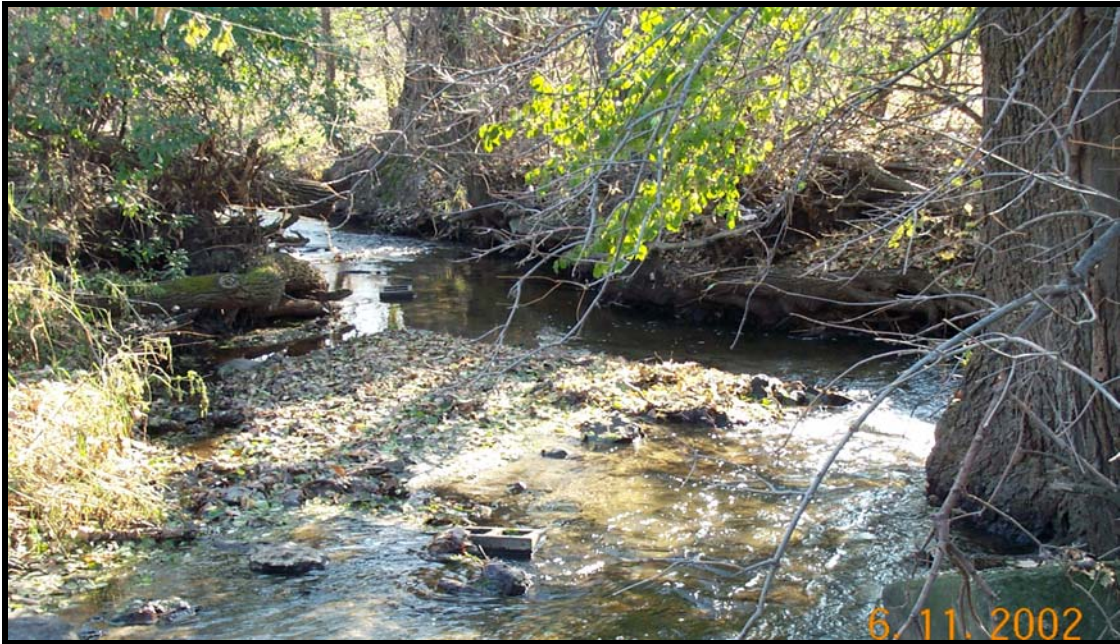


Table 1.RI. Riley Creek Monitoring Station Information



Station Address: 15995 Flying Cloud Drive, Eden Prairie, MN
County: Hennepin
Major Basin: Minnesota River Basin
Watershed: Riley Creek
Drainage Area: 13 square miles

Station Operator: Riley-Purgatory-Bluff Creek Watershed District /
Barr Engineering, Inc.

Metropolitan Council Environmental Services Contact Information:

Contact Person: Leigh Harrod, P.G.
Address: 2400 Childs Road
St Paul, MN 55106
Phone: 651-602-8085
E-mail: leigh.harrod@metc.state.mn.us

Watershed District or Watershed Management Organization:
Riley-Purgatory-Bluff Creek Watershed District

Station Overview: MCES, with funding provided by the Minnesota Legislature via a grant from the Minnesota Pollution Control Agency (MPCA), has supported water quality monitoring of Riley Creek since 1999. The monitoring station is located in Eden Prairie, Minnesota, 1.3 miles upstream from the creek confluence with the Minnesota River. MCES formerly operated a monitoring station on Riley Creek at this location (Mile 1.3) during the 1989-1991 period. Riley Creek originates in Lake Lucy and Lake

Ann in the upper watershed. From there the creek generally flows southeast through Lake Susan, Rice Marsh Lake, and Riley Lake before it reaches the monitoring station. Below the station, Riley Creek flows into Grass Lake before reaching its confluence with the Minnesota River. During the 1989-1990 period, MCES also operated a second monitoring station on Riley Creek, immediately upstream from the creek confluence with the Minnesota River (Mile 0.0).

MCES partners with the Riley-Purgatory-Bluff Creek Watershed District to operate the monitoring station and maintain the rating curve through the district's consulting engineering company, Barr Engineering, Inc. A rain gauge is present at this location for measurement of precipitation.

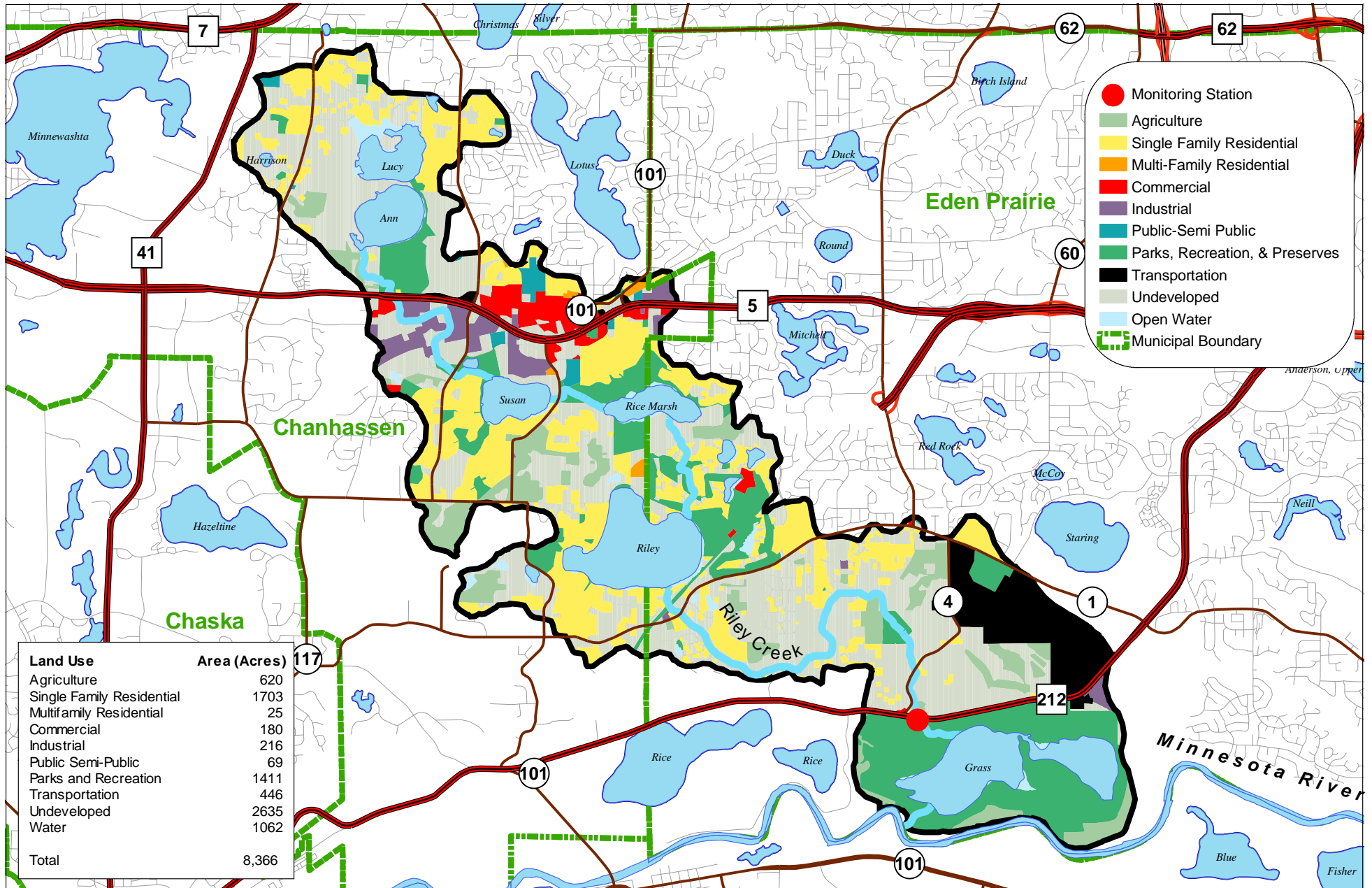
2003 Monitoring Year: Riley Creek flow was perennial in 2003 due to groundwater discharge from Quaternary terrace deposits. Spring snowmelt began in mid-March. Numerous rainfall events occurred throughout the spring and early summer of 2003. The peak daily average flow of 19.7 cfs, with a stage of 0.43 feet, occurred on May 11, 2003, when 0.85 inch of rain was recorded by the station's rain gauge. The largest rain event (1.53 inches) occurred on June 25. This wet pattern tapered off dramatically after mid-July, when drought conditions became prevalent. Daily average flows were estimated during the August-September period, since the ultrasonic sensor at this site cannot accurately measure stage during prolonged drought conditions.

Despite extremely cold air temperatures, baseflow grab samples were successfully collected during the winter months of 2003. Runoff event-based composite sampling began in mid-March 2003 and continued through mid-October. The highest total suspended solids (TSS) concentration (2,970 mg/l) observed in 2003 was measured in a composite sample collected during the July 14, 2003 storm event, after a series of rain events during the preceding 3 weeks had created saturated soil conditions in the watershed.

Twenty-two samples were collected for water quality analysis during 2003, including 13 composite samples and 9 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 2003 sampling scheme did not quite meet the goals of the MCES monitoring work plan, as monthly baseflow grab samples were not obtained in February, May, and September. However, all runoff events in 2003 were well characterized by flow-weighted composite samples. A limited number of composite samples were obtained during the last half of 2003 due to drought conditions.

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

Figure 1.RI. Riley Creek Monitoring Station Location and Watershed Characteristics



0 0.4 0.8 1.6 Miles



Figure 2.RI. Riley Creek 2003 Hydrograph, Precipitation and Sampling Information

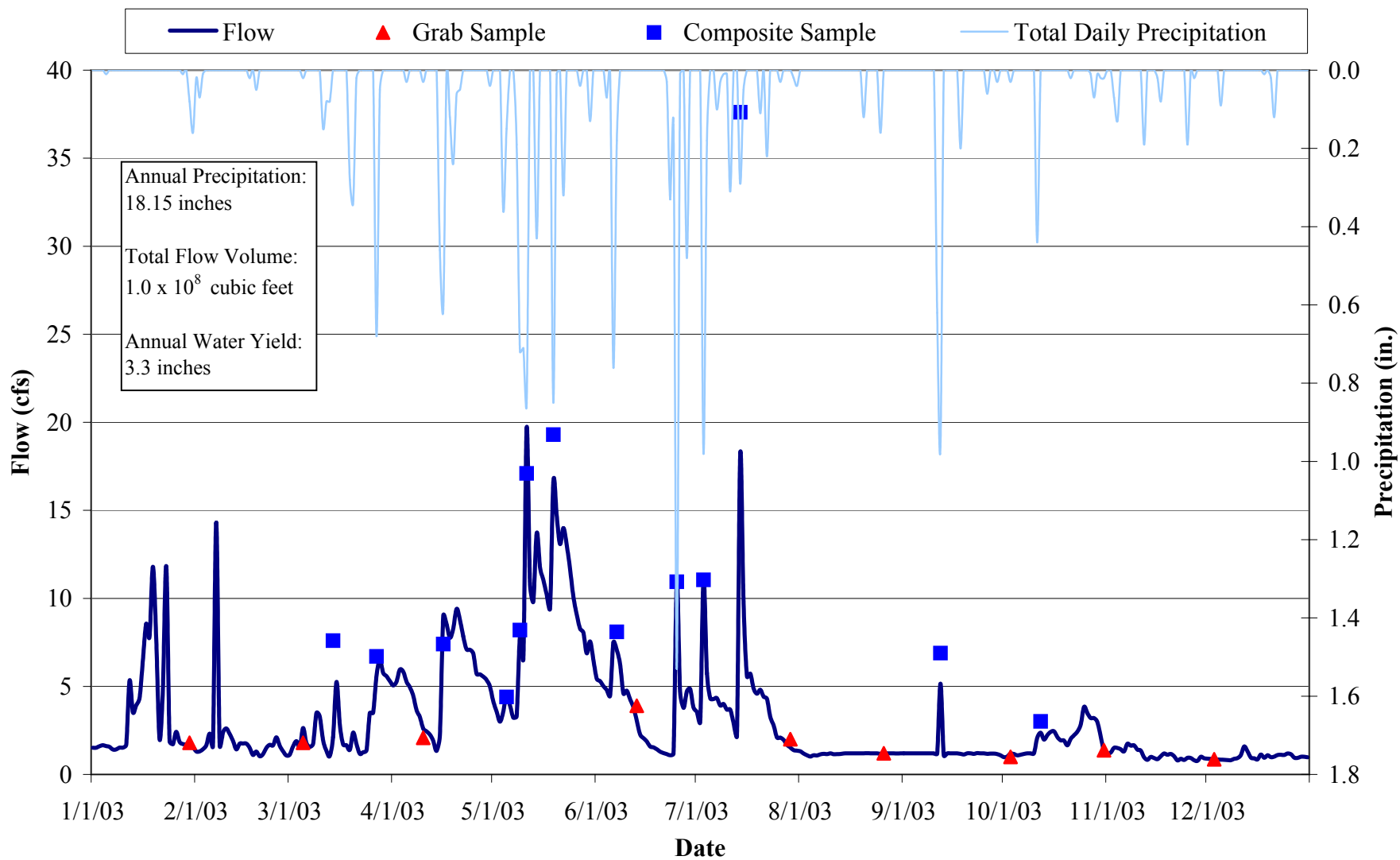


Table 2.RI. Riley Creek 2003 Water Chemistry Information

Variable	N	Mean	Median	Minimum	Maximum	25%	75%	STD
Chloride, mg/L	22	47	44	22	71	38	60	15
Hardness, mg/L	21	203	176	100	352	150	218	82
Cadmium, ug/L	5	0.3	0.4	<0.1	0.4	<0.1	0.4	0.2
Chromium, ug/L	5	10.2	9.5	0.2	27.6	0.3	13.4	11.3
Copper, ug/L	5	10.8	15.2	0.7	18.4	2.3	17.5	8.6
Lead, ug/L	5	8.4	11.2	0.1	16.5	0.8	13.3	7.5
Nickel, ug/L	5	16.3	18.3	2.9	33.0	3.3	24.0	13.1
Zinc, ug/L	5	34.4	49.0	2.3	63.0	5.5	52.0	28.3
Total Kjeldahl Nitrogen, mg/L	22	1.87	1.12	0.10	8.50	0.27	2.88	2.04
Total Nitrate Nitrogen, mg/L	22	1.03	0.69	0.32	2.30	0.50	1.60	0.70
Total Phosphorus, mg/L	22	0.58	0.19	0.03	2.89	0.05	0.87	0.75
Total Dissolved Phosphorus, mg/L	19	0.09	0.04	0.01	0.97	0.02	0.05	0.21
Total Suspended Solids, mg/L	22	447	147	1	2970	4	535	692
Volatile Suspended Solids, mg/L	22	47	12	1	310	2	72	72
Turbidity, NTU	11	29	4	2	160	2	12	56

N: Sample Count

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

STD: Standard Deviation

Table 3.RI. Riley Creek 2003 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	1,090	262	79	350
Total Phosphorus	1.77	0.43	0.13	0.57
Total Dissolved Phosphorus	0.12	0.03	0.01	0.04
Total Nitrate Nitrogen	3.22	0.77	0.23	1.04

* 2003 Annual Loading Information is provisional and may be subject to minor revisions.

Figure 3.RI. Riley Creek 2003 Hydrograph with Total Suspended Solids and Nitrate Nitrogen Concentrations

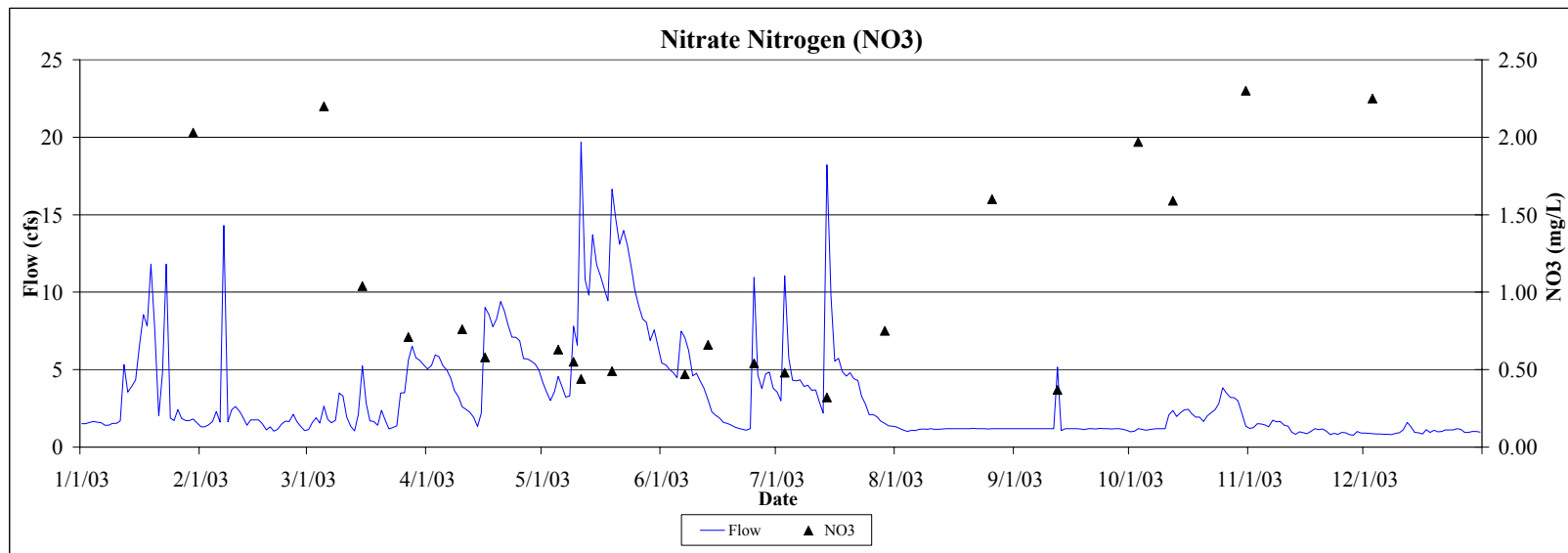
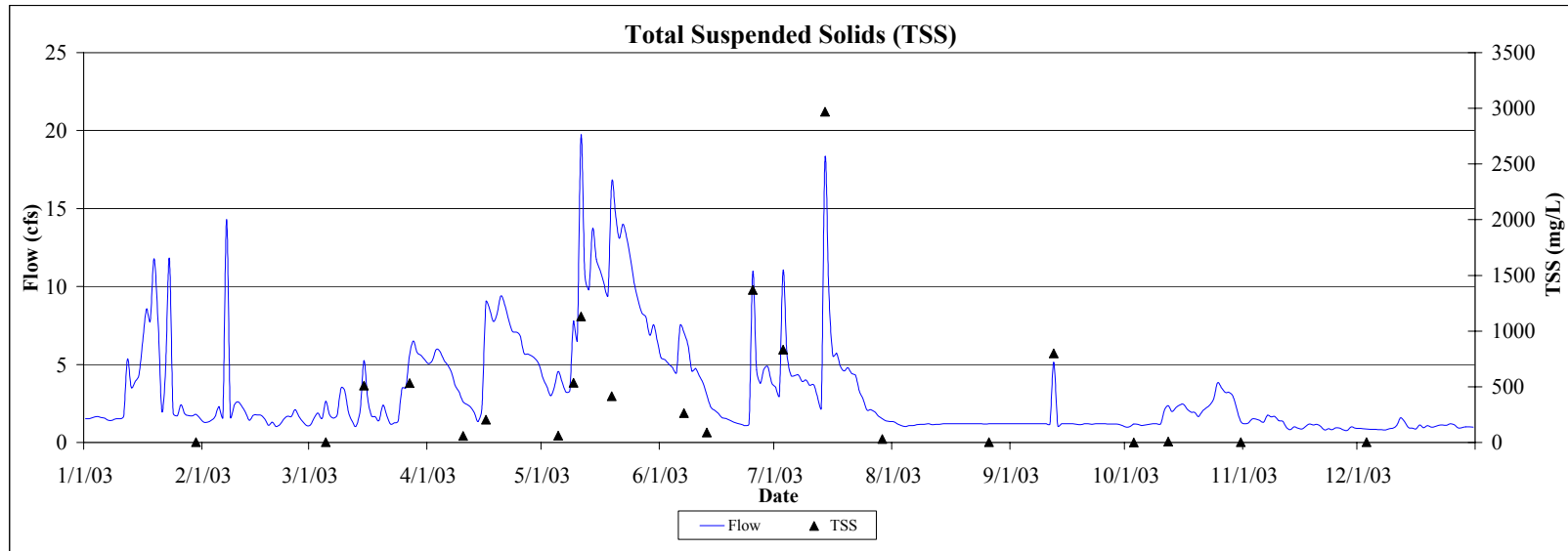


Figure 4.RI. Riley Creek 2003 Hydrograph with Total and Dissolved Phosphorus Concentrations

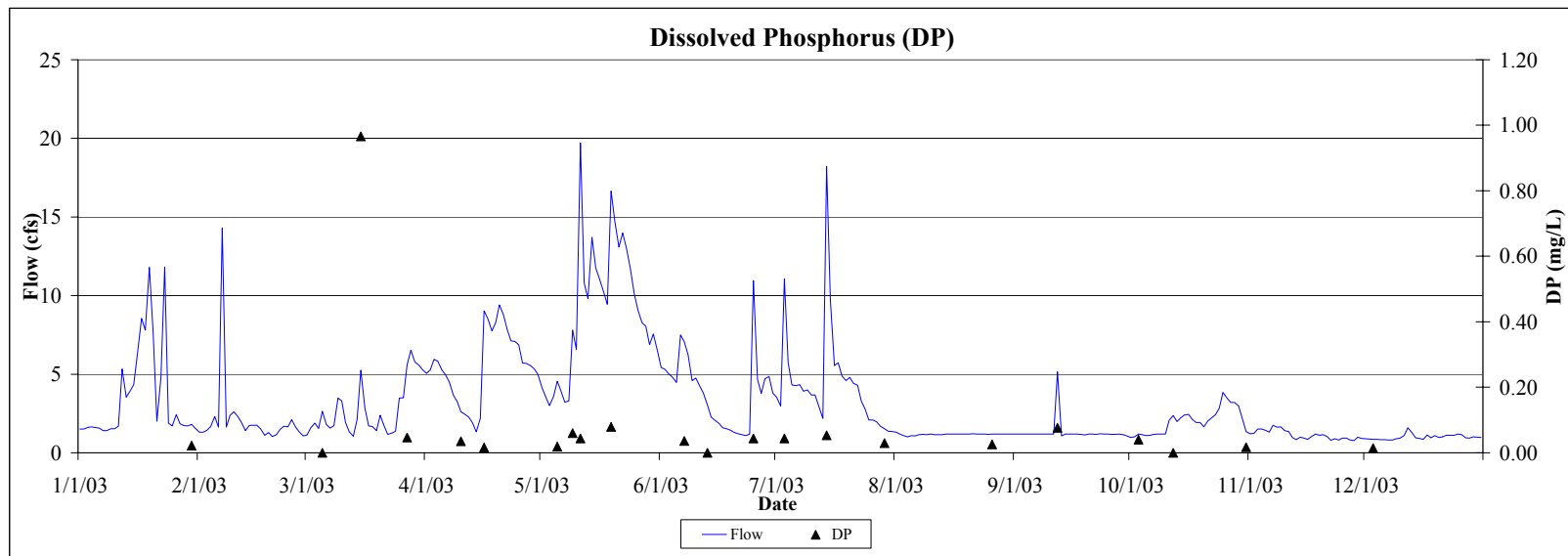
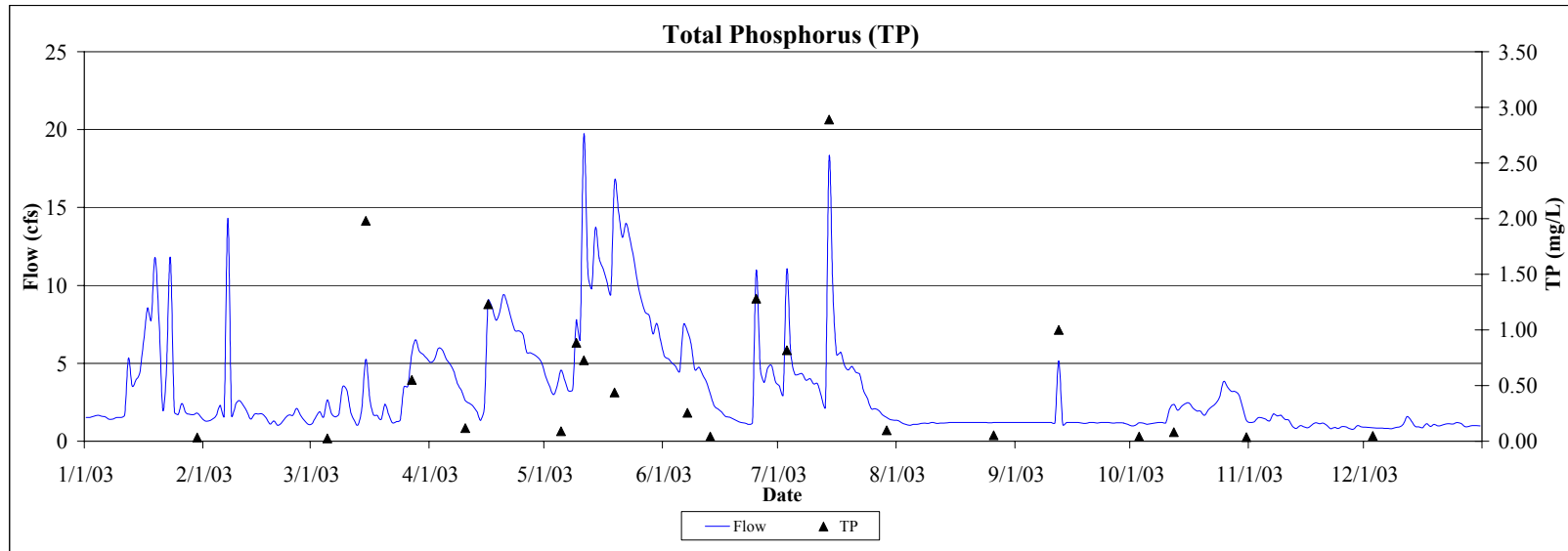


Table 4.RI. Riley Creek: Comparison of 2001-2003 Hydrology and Water Chemistry

	2001*	2002*	2003
Hydrology			
Total Precipitation (inches)	26.22	39.72	18.15
Water Yield (inches)	5.4	6.1	3.3
Total Volume (cubic feet)	1.6 x 10 ⁸	1.8 x 10 ⁸	1.0 x 10 ⁸
Annual Load (tons)			
Total Suspended Solids	3,680	3,240	1,090
Total Phosphorus	3.50	3.48	1.77
Total Dissolved Phosphorus	0.32	0.34	0.12
Total Nitrate Nitrogen	3.52	4.27	3.22
Annual Yield (lbs/acre)			
Total Suspended Solids	885	779	262
Total Phosphorus	0.84	0.84	0.43
Total Dissolved Phosphorus	0.08	0.08	0.03
Total Nitrate Nitrogen	0.85	1.03	0.77
Annual Normalized Yield (lbs/acre/inch of water)			
Total Suspended Solids	164	128	79
Total Phosphorus	0.16	0.14	0.13
Total Dissolved Phosphorus	0.01	0.01	0.01
Total Nitrate Nitrogen	0.16	0.17	0.23
Flow-Weighted Mean Concentration (mg/L)			
Total Suspended Solids	725	571	350
Total Phosphorus	0.69	0.61	0.57
Total Dissolved Phosphorus	0.06	0.06	0.04
Total Nitrate Nitrogen	0.69	0.75	1.04

* Note: Annual loads, yields, normalized yields, and flow-weighted mean concentrations have been revised.

Table 5.RI. Riley Creek 2003 Macroinvertebrate Monitoring Results and Metrics

Monitoring Date 6/20/2003

Class	Order	Family	Common Name	Organism Count
Arthropoda	Amphipoda		Scuds	60
Insecta	Coleoptera	Dryopidae	Longtoed Water Beetles	5
Insecta	Diptera	Tipulidae	Crane Flies	3
Insecta	Diptera	Chironomidae	Midges	35
Insecta	Diptera	Simuliidae	Black Flies	4
Insecta	Ephemeroptera	Baetidae	Small Minnow Mayflies	7
Insecta	Trichoptera	Hydropsychidae	Common Netspinners	26
Turbellaria	Tricladida	Planariidae	Planarians	2

Macroinvertebrate Taxa Metrics

Total Taxa	8
EPT Taxa	2
% EPT Taxa	25
Diptera Taxa	3
% Diptera Taxa	38
Mean Tolerance Value	4.9

Macroinvertebrate Organism Metrics

Total Individuals	142
EPT Individuals	33
% EPT Individuals	23
Diptera Individuals	42
% Diptera Individuals	30
Chironomidae Individuals	35
% Chironomidae Individuals	25

Water Quality

Degree of Organic Pollution

Family-Level Biotic Index	5.4	Fair	Fairly Significant Organic Pollution
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