Table 1.NM. Nine Mile Creek Monitoring Station Information

Station Address: James Road, Bloomington, MN
County: Hennepin
Major Basin: Minnesota River Basin
Watershed: Nine Mile Creek
Drainage Area: 38.3 square miles

Station Operator: Metropolitan Council Environmental Services

Metropolitan Council Environmental Services Contact Information:

Contact Person: Tim Pattock or Mike Ahlf
Address: 2400 Childs Road
St. Paul, MN 55106
Phone: 651-602-8084 (Tim) or 651-602-8082 (Mike)
E-mail: timothy.pattock@metc.state.mn.us
mike.ahlf@metc.state.mn.us

Watershed District or Watershed Management Organization:
Nine Mile Creek Watershed District

Station Overview: MCES has conducted water quality monitoring of Nine Mile Creek since 1989. The monitoring station is located in Bloomington, Minnesota, 1.8 miles upstream from the creek confluence with the Minnesota River. MCES staff maintain the

rating curve at this station. There is no rain gauge at this station; however, precipitation data are obtained from the Minnesota Climatology Working Group, Bloomington Station Number 217538.

2002 Monitoring Year: Winter ice conditions in Nine Mile Creek were minimal, allowing for accurate flow measurements beginning January 2, 2002. Snowmelt occurred in mid to late March, but had a limited impact on Nine Mile Creek flow.

Runoff event-based composite sampling began in mid April 2002 and continued through early October. The peak daily average flow of 231 cfs, with a stage of 2.03 feet, occurred on June 26, 2002. This runoff event also produced the highest total suspended solids (TSS) concentration (514 mg/l) and the highest total phosphorus (TP) concentration (0.48 mg/l) measured at this station in 2002. Due to the large amount of impervious surface in the Nine Mile Creek Watershed, including storm drainage from the Interstate Highway 35W corridor, the stream hydrograph responds rapidly to rain events and is characterized by numerous sharp peaks.

Forty-four samples were collected for water quality analysis during 2002, including 24 composite samples and 20 grab samples. Samples were obtained throughout the year during varying stream flow conditions to most accurately characterize Nine Mile Creek water quality. 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 met the goals of the MCES monitoring work plan.

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

Figure 1.NM. Nine Mile Creek Monitoring Station Location and Watershed Characteristics

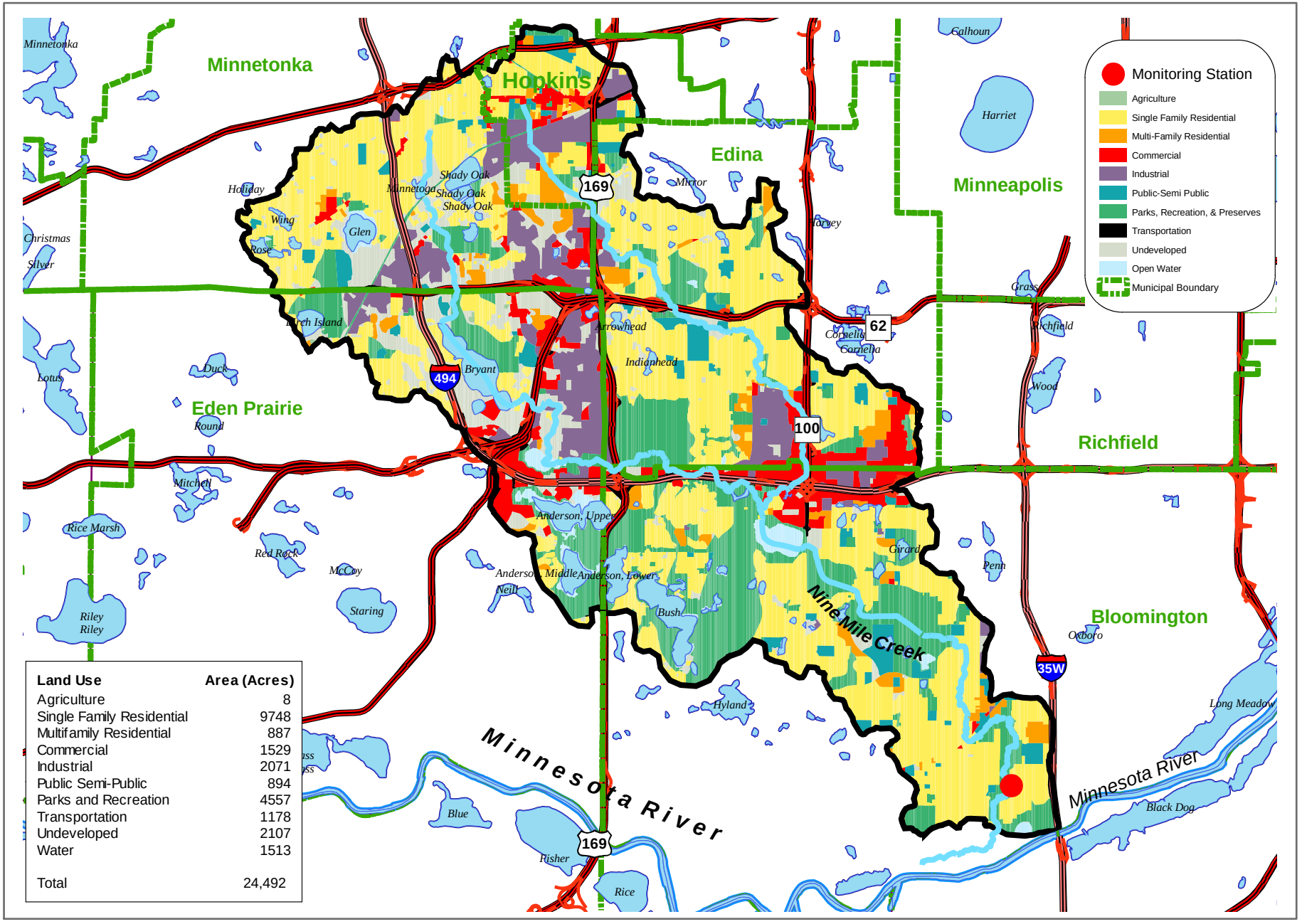


Figure 2.NM. Nine Mile Creek 2002 Hydrograph, Precipitation and Sampling Information

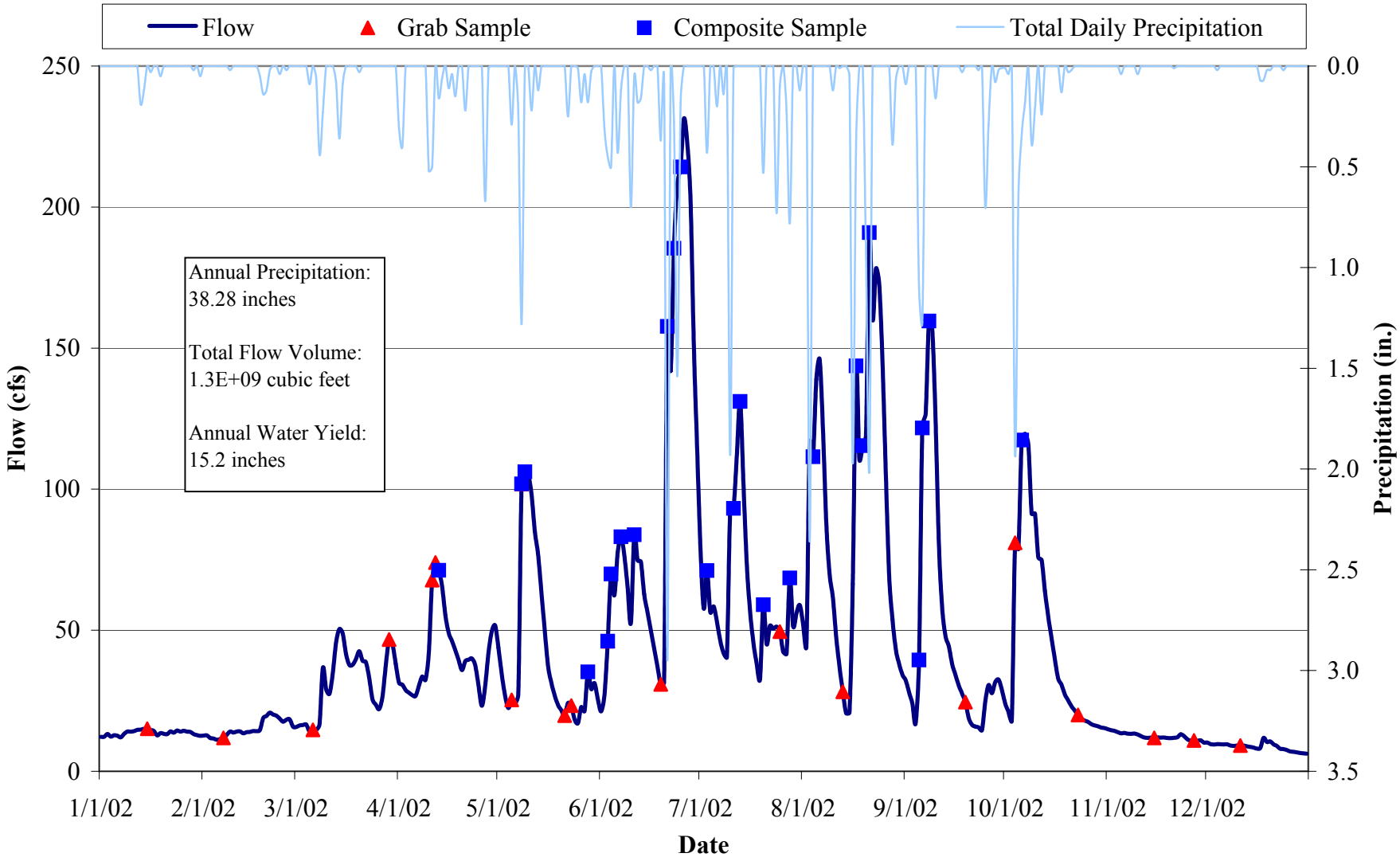


Table 2.NM. Nine Mile Creek 2002 Water Chemistry Information

Variable	N	Mean	Median	Minimum	Maximum	25%	75%	STD
Chloride, mg/L	44	70	48	10	278	29	99	61
Hardness, mg/L	18	149	138	52	336	92	171	80
Cadmium, ug/L	16	0.1	0.1	0.1	0.4	0.1	0.2	0.1
Chromium, ug/L	16	1.6	0.9	0.2	8.2	0.3	1.5	2.1
Copper, ug/L	16	5.1	3.8	1.7	17.3	2.2	6.3	4.1
Lead,ug/L	16	4.3	3.0	0.2	18.5	0.3	4.9	5.0
Nickel, ug/L	16	3.2	2.7	1.8	7.9	2.3	3.5	1.5
Zinc, ug/L	16	19.2	11.7	1.3	99.0	2.2	22.9	24.6
Nitrogen, Total Kjeldahl, mg/L	43	1.80	1.10	0.32	7.40	0.74	2.05	1.67
Nitrogen, Total Nitrate, mg/L	43	0.47	0.45	0.03	1.11	0.25	0.65	0.24
Phosphorus, Total, mg/L	43	0.27	0.19	0.01	1.14	0.09	0.34	0.28
Phosphorus, Total Dissolved, mg/L	35	0.04	0.03	0.01	0.28	0.02	0.05	0.05
Solids, Total Suspended, mg/L	33	87	35	1	514	4	108	124
Solids, Volatile Suspended, mg/L	33	21	10	1	108	2	22	28
Turbidity, NTU	42	28	16	1	110	4	39	30

N: Sample Count

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

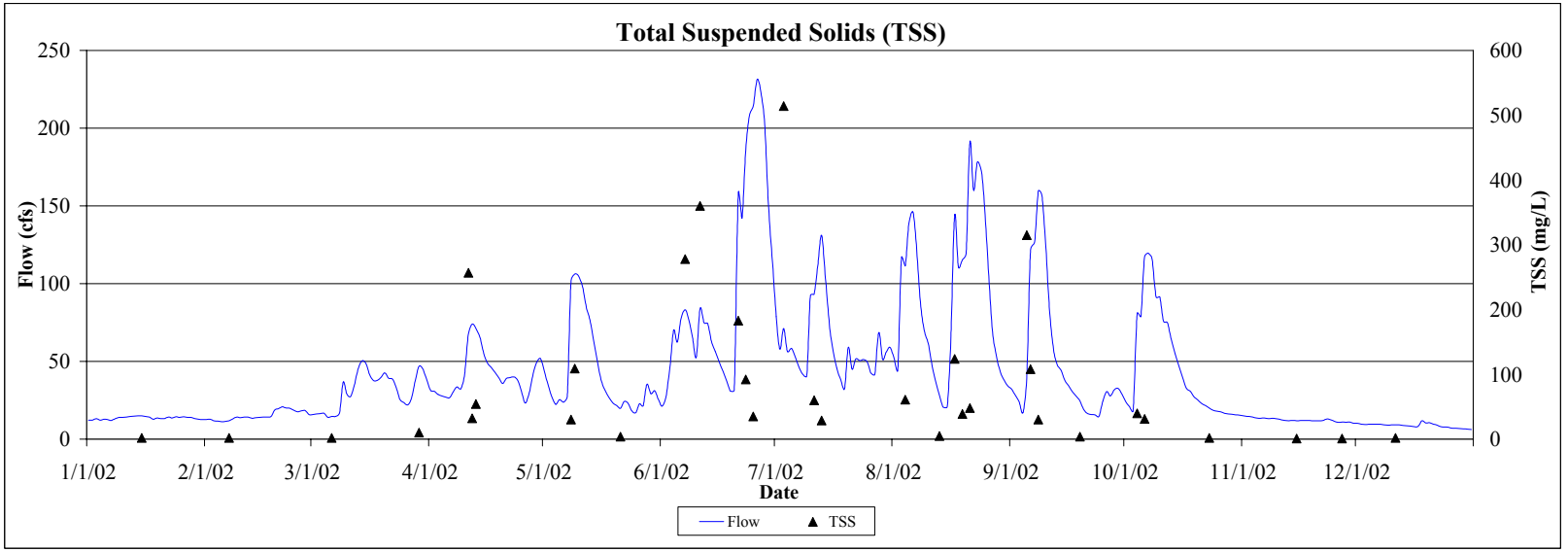
STD: Standard Deviation

Table 3.NM. Nine Mile 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)
Solids, Total Suspended	3,100	253	17	74
Phosphorus, Total	8.39	0.68	0.05	0.20
Phosphorus, Total Dissolved	1.75	0.14	0.01	0.04
Nitrogen, Total Nitrate	17.6	1.44	0.09	0.42

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

Figure 3.NM. Nine Mile Creek 2002 Hydrograph with Total Suspended Solids and Nitrate Nitrogen Concentrations



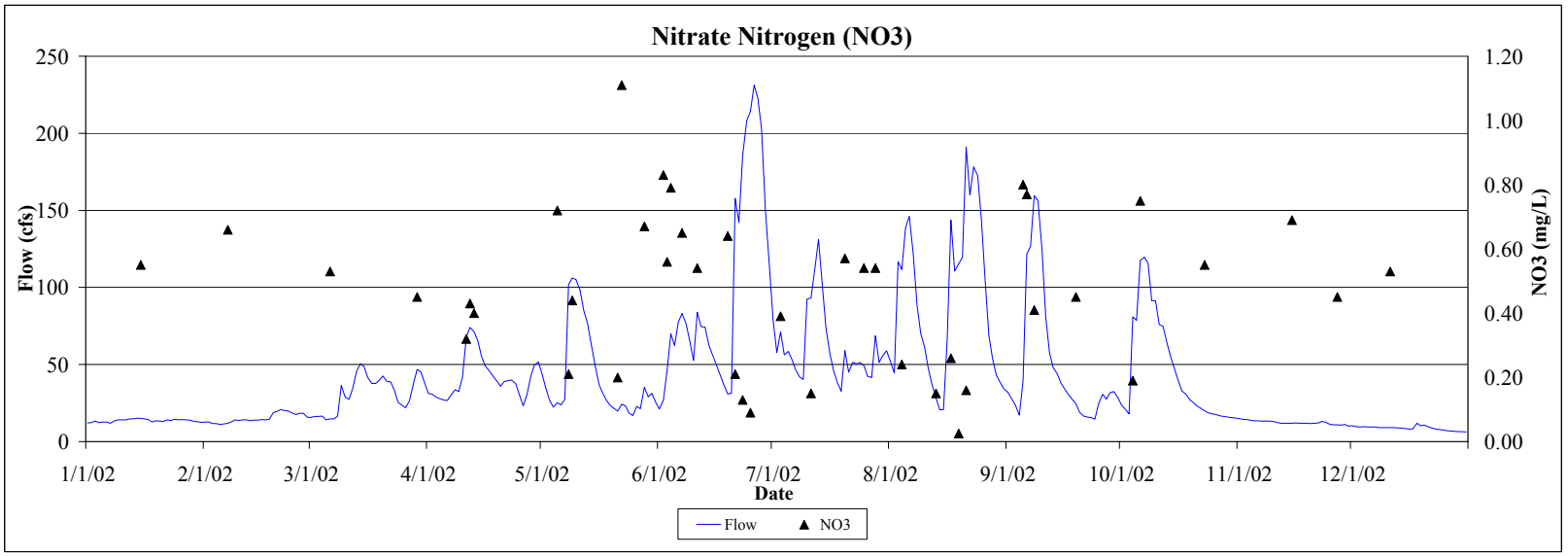
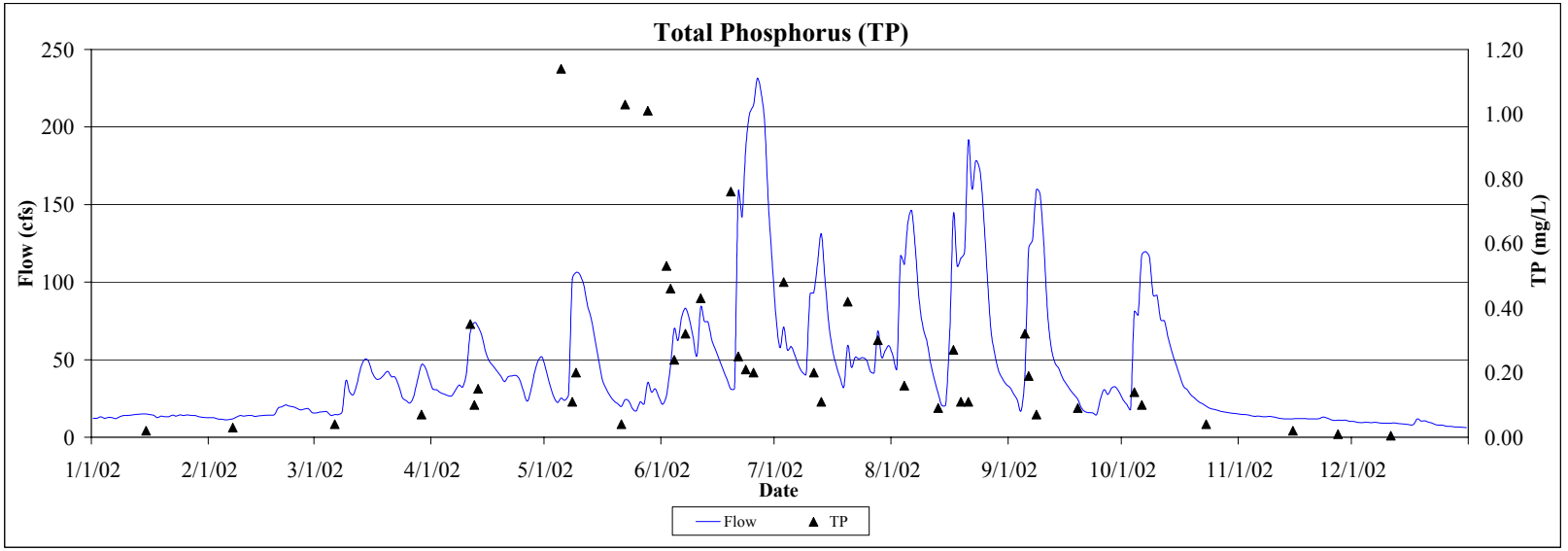


Figure 4.NM. Nine Mile Creek 2002 Hydrograph with Total and Dissolved Phosphorus Concentrations



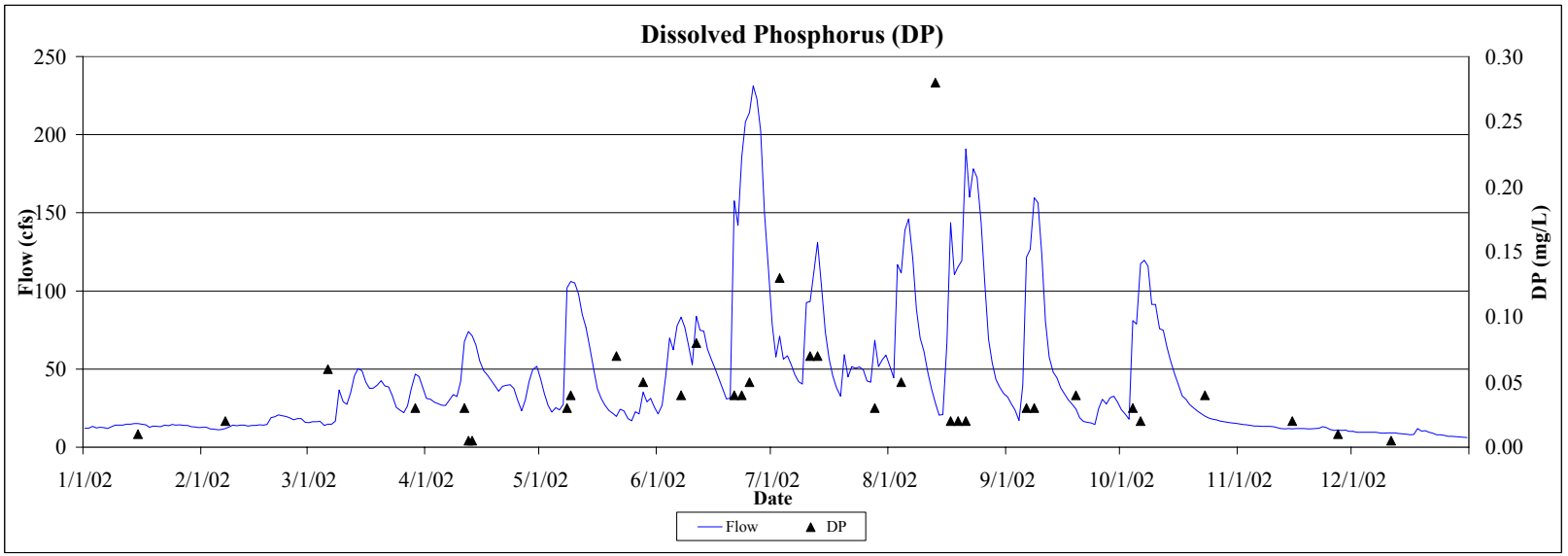


Table 4.NM. Nine Mile Creek: Comparison of 2001-2002 Hydrology and Water Chemistry

	2001	2002
Hydrology		
Total Precipitation (in)	34.23	38.28
Water Yield (in)	10.7	15.2
Total Volume (cf)	9.5E+08	1.3E+09
Annual Load (tons)		
Total Suspended Solids	1,490	3,100
Total Phosphorus	4.15	8.39
Total Dissolved Phosphorus	0.97	1.75
Total Nitrate Nitrogen	18.7	17.6
Annual Yield (lbs/acre)		
Total Suspended Solids	121	253
Total Phosphorus	0.34	0.68
Total Dissolved Phosphorus	0.08	0.14
Total Nitrate Nitrogen	1.52	1.44
Annual Normalized Yield (lbs/acre/in of water)		
Total Suspended Solids	11	17
Total Phosphorus	0.03	0.05
Total Dissolved Phosphorus	0.01	0.01
Total Nitrate Nitrogen	0.14	0.09
Flow-Weighted Mean Concentration (mg/L)		
Total Suspended Solids	50	74
Total Phosphorus	0.14	0.20
Total Dissolved Phosphorus	0.03	0.04
Total Nitrate Nitrogen	0.63	0.42