

Table 1.CA. Carver Creek Monitoring Station Information



Station Address: 14025^{1/2} Carver County Road 40, Carver, MN
County: Carver
Major Basin: Minnesota River Basin
Watershed: Carver Creek
Drainage Area: 83.5 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:

Station Overview: MCES has conducted water quality monitoring of Carver Creek since 1989. The monitoring station is located in Carver, Minnesota, 1.7 miles upstream from the creek confluence with the Minnesota River. MCES staff maintain the rating

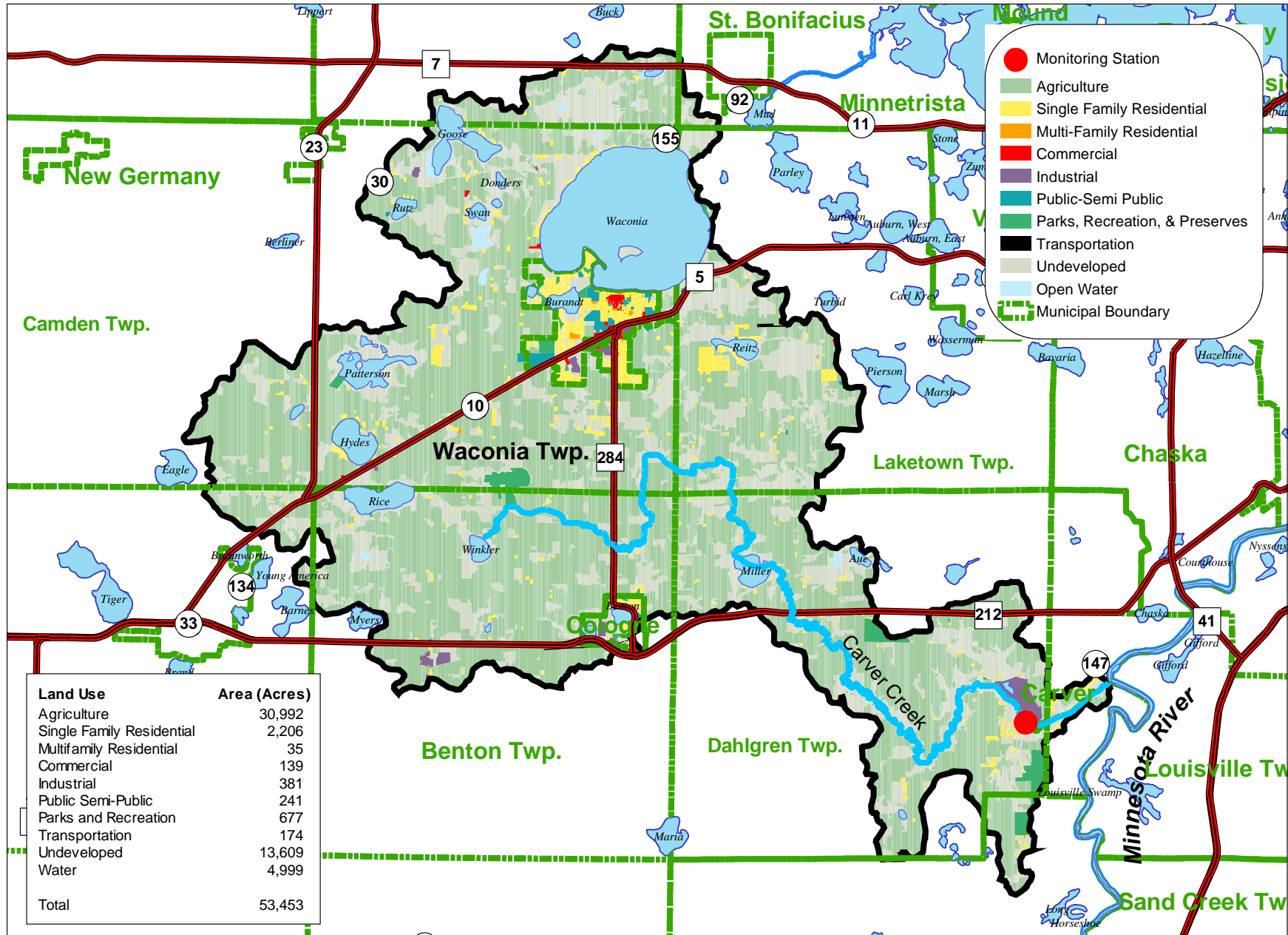
curve at this station. There is no rain gauge at this station; however, precipitation data are obtained from the Minnesota Climatology Working Group, Chanhassen Station Number 211448. Due to major roadwork and bridge replacement along Carver County Road 40, this monitoring station was shut down and removed on May 27, 2003. The monitoring station remained out of service for the duration of the year.

2003 Monitoring Year: Spring snowmelt began in mid-March, and the stream was ice-free on March 17, 2003. Runoff event-based composite sampling began in mid-March and continued into late May, when the monitoring station was removed. A runoff event on May 23 produced a peak daily average flow of 171 cfs.

Despite the shortened monitoring season, twenty-two samples were collected for water quality analysis during 2003, including 11 composite samples and 11 grab samples. To the extent that road and bridge construction allowed access to the monitoring site, samples were obtained throughout most of the year during varying stream flow conditions, to most accurately characterize Carver 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). Due to road and bridge construction, the 2003 sampling scheme did not meet 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.CA. Carver Creek Monitoring Station Location and Watershed Characteristics



0 1 2 4 Miles



Figure 2.CA. Carver Creek 2003 Hydrograph, Precipitation and Sampling Information

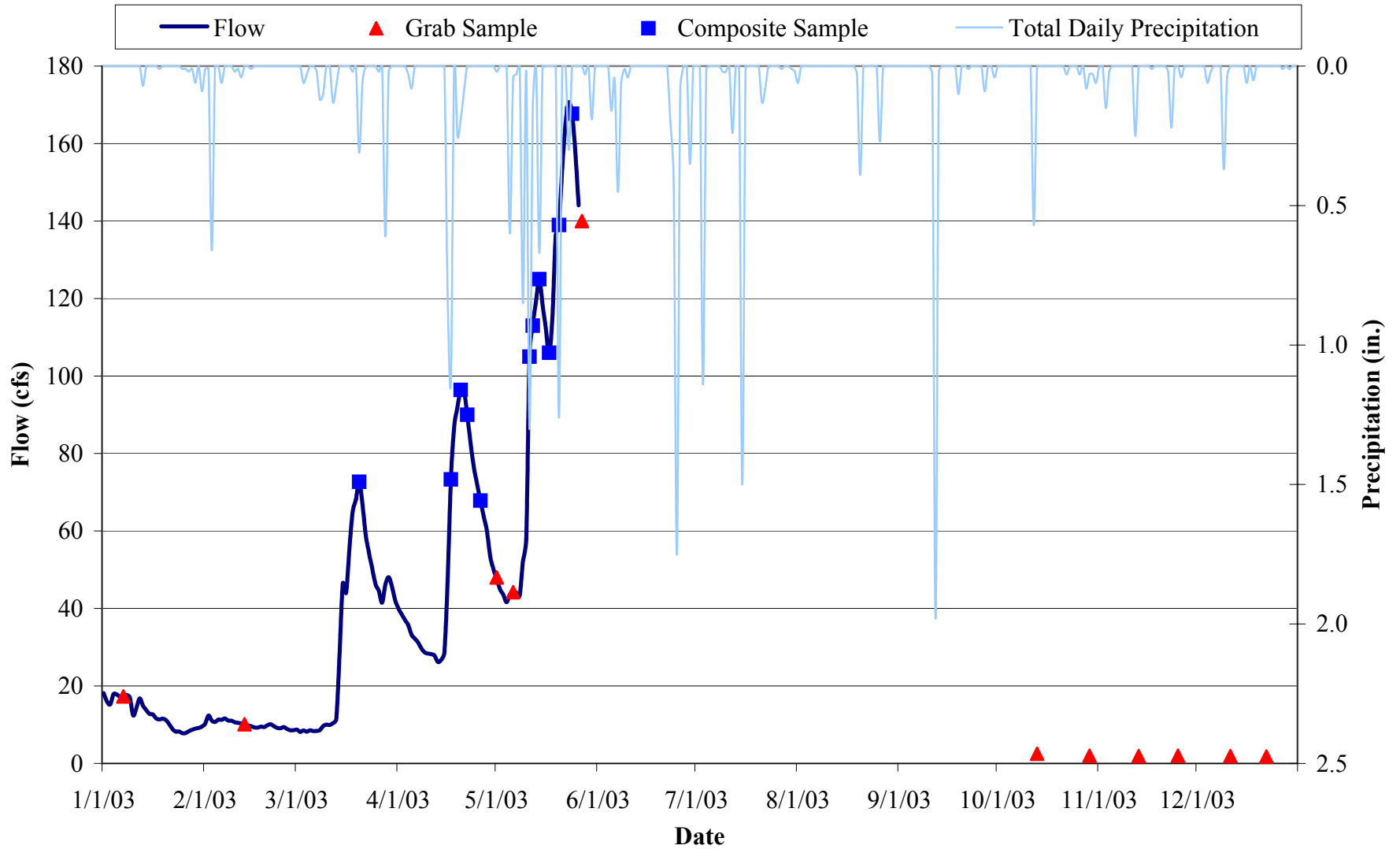


Table 2.CA. Carver Creek 2003 Water Chemistry Information

| Variable | N | Mean | Median | Minimum | Maximum | 25% | 75% | STD |
|----------------------------------|----|------|--------|---------|---------|------|------|------|
| Chloride, mg/L | 20 | 38 | 42 | 22 | 51 | 30 | 45 | 9 |
| Hardness, mg/L | 6 | 275 | 272 | 204 | 360 | 369 | 275 | 50 |
| Cadmium, ug/L | 5 | 0.1 | 0.1 | <0.1 | 0.4 | <0.1 | 0.2 | 0.2 |
| Chromium, ug/L | 5 | 2.1 | 1.3 | 0.5 | 5.6 | 0.8 | 2.1 | 2.1 |
| Copper, ug/L | 5 | 4.5 | 2.6 | 1.7 | 8.6 | 2.2 | 7.5 | 3.3 |
| Lead, ug/L | 5 | 2.1 | 1.1 | 0.1 | 7.6 | 0.4 | 1.5 | 3.1 |
| Nickel, ug/L | 5 | 6.2 | 5.1 | 3.4 | 12.4 | 4.3 | 5.8 | 3.6 |
| Zinc, ug/L | 5 | 8.9 | 5.5 | 1.0 | 24.0 | 2.7 | 11.1 | 9.3 |
| Total Kjeldahl Nitrogen, mg/L | 22 | 1.65 | 1.85 | 0.15 | 3.60 | 0.61 | 2.20 | 1.01 |
| Total Nitrate Nitrogen, mg/L | 22 | 2.00 | 2.00 | 0.94 | 3.08 | 1.30 | 2.60 | 0.68 |
| Total Phosphorus, mg/L | 22 | 0.20 | 0.19 | 0.01 | 0.52 | 0.04 | 0.26 | 0.16 |
| Total Dissolved Phosphorus, mg/L | 22 | 0.06 | 0.03 | 0.01 | 0.33 | 0.01 | 0.06 | 0.09 |
| Total Suspended Solids, mg/L | 22 | 96 | 78 | 1 | 436 | 7 | 130 | 107 |
| Volatile Suspended Solids, mg/L | 22 | 14 | 13 | 1 | 44 | 2 | 19 | 12 |
| Turbidity, NTU | 22 | 20 | 16 | 2 | 100 | 4 | 27 | 22 |

N: Sample Count

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

STD: Standard Deviation

Table 3.CA. Carver 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 | na | na | na | na |
| Total Phosphorus | na | na | na | na |
| Total Dissolved Phosphorus | na | na | na | na |
| Total Nitrate Nitrogen | na | na | na | na |

na: Data are insufficient to calculate these statistics.

* 2003 Annual Loading Information is not available.

Figure 3.CA. Carver Creek 2003 Hydrograph with Total Suspended Solids and Nitrate Nitrogen Concentrations

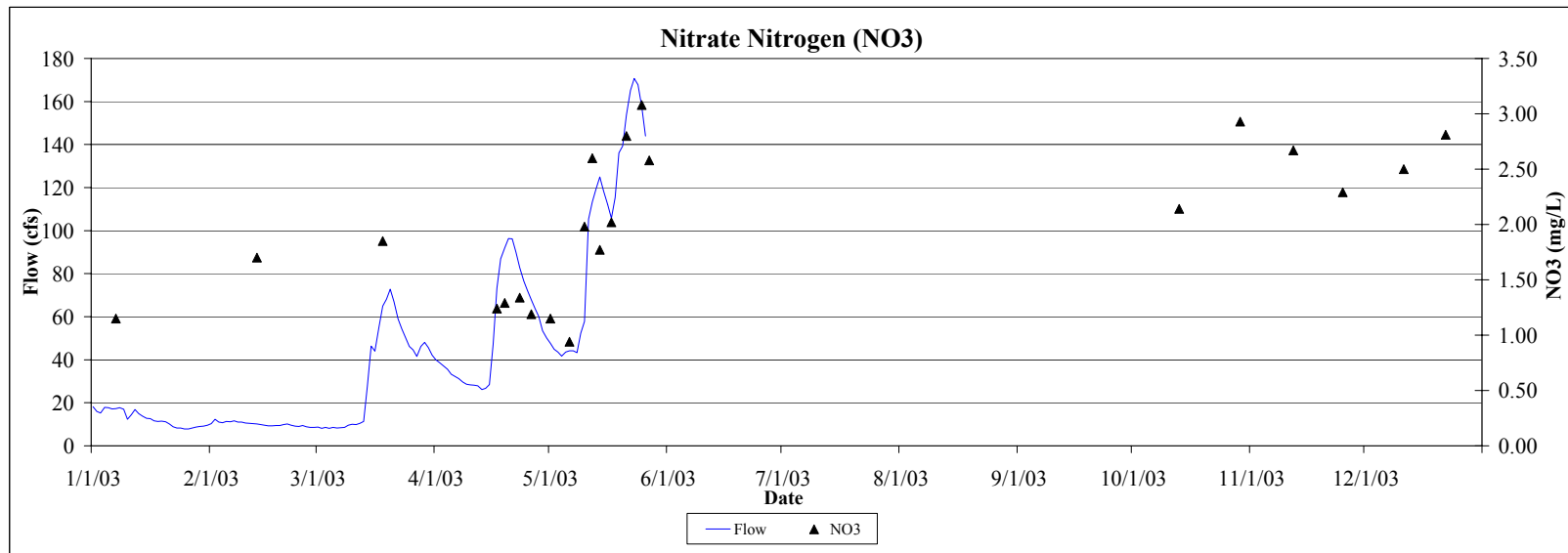
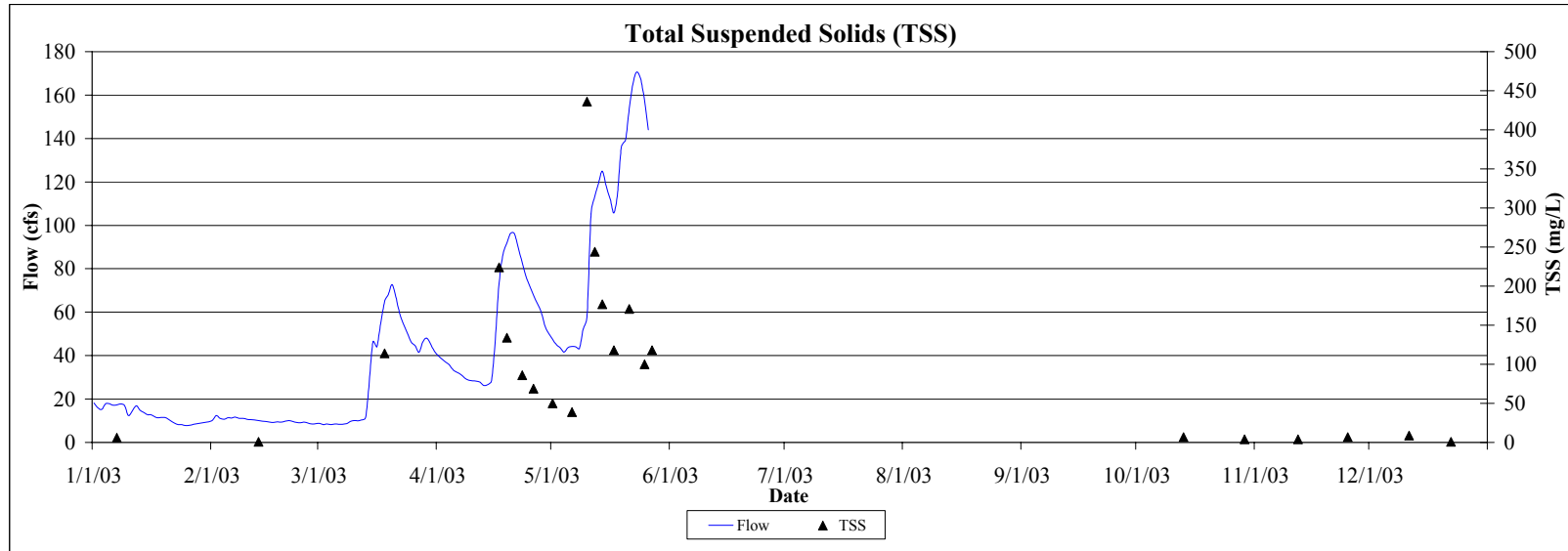


Figure 4.CA. Carver Creek 2003 Hydrograph with Total and Dissolved Phosphorus Concentrations

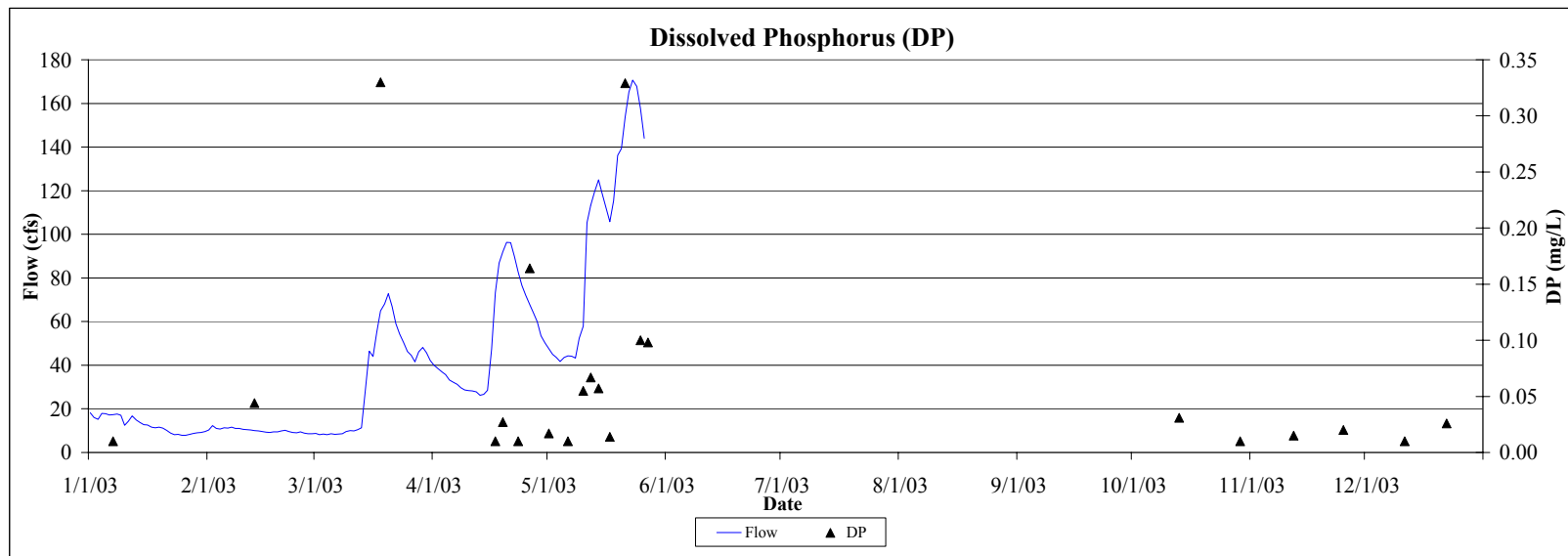
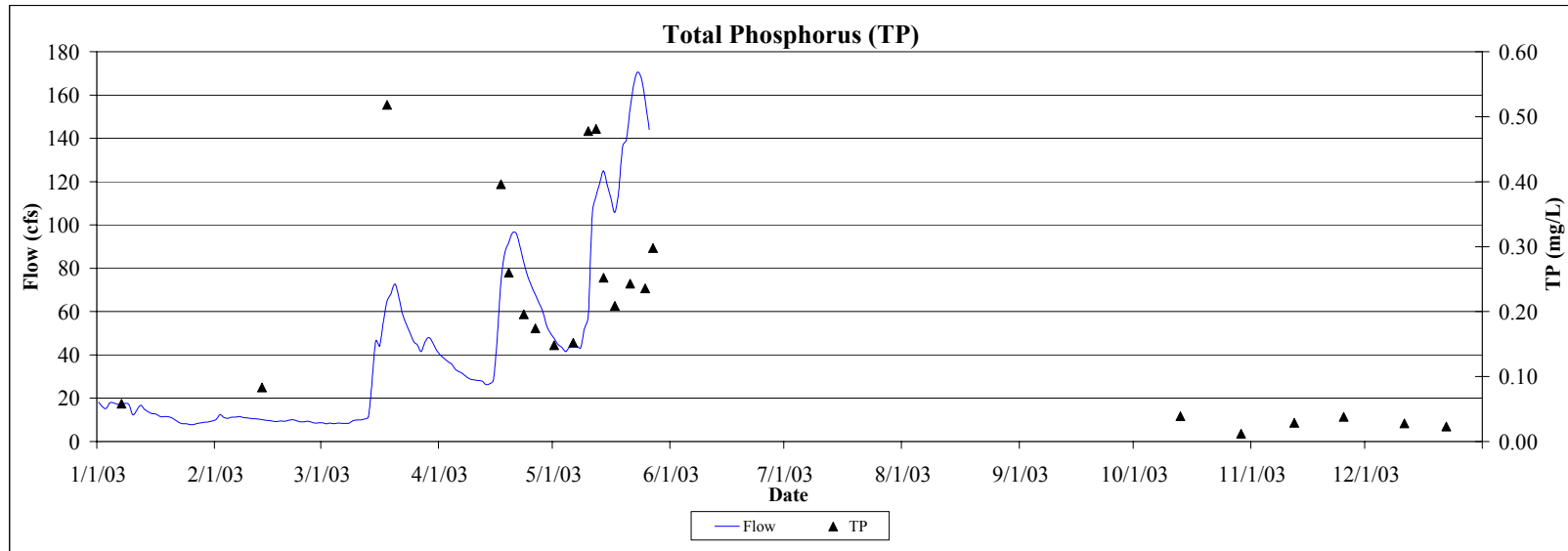


Table 4.CA. Carver Creek: Comparison of 2001-2003 Hydrology and Water Chemistry

| | 2001 | 2002 | 2003 |
|---|-----------------------|-----------------------|-------------------|
| Hydrology | | | |
| Total Precipitation (inches) | 27.99 | 36.18 | 19.87 |
| Water Yield (inches) | 6.4 | 8.6 | insufficient data |
| Total Volume (cubic feet) | 1.2 x 10 ⁹ | 1.7 x 10 ⁹ | insufficient data |
| Annual Load (tons) | | | |
| Total Suspended Solids | 11,800 | 13,200 | insufficient data |
| Total Phosphorus | 25.5 | 30.3 | insufficient data |
| Total Dissolved Phosphorus | 9.9 | 12.2 | insufficient data |
| Total Nitrate Nitrogen | 132 | 155 | insufficient data |
| Annual Yield (lbs/acre) | | | |
| Total Suspended Solids | 446 | 496 | insufficient data |
| Total Phosphorus | 0.96 | 1.14 | insufficient data |
| Total Dissolved Phosphorus | 0.37 | 0.46 | insufficient data |
| Total Nitrate Nitrogen | 4.97 | 5.84 | insufficient data |
| Annual Normalized Yield (lbs/acre/inch of water) | | | |
| Total Suspended Solids | 70 | 58 | insufficient data |
| Total Phosphorus | 0.15 | 0.13 | insufficient data |
| Total Dissolved Phosphorus | 0.06 | 0.05 | insufficient data |
| Total Nitrate Nitrogen | 0.78 | 0.68 | insufficient data |
| Flow-Weighted Mean Concentration (mg/L) | | | |
| Total Suspended Solids | 306 | 254 | insufficient data |
| Total Phosphorus | 0.66 | 0.58 | insufficient data |
| Total Dissolved Phosphorus | 0.26 | 0.24 | insufficient data |
| Total Nitrate Nitrogen | 3.42 | 3.00 | insufficient data |